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THE RECORD OF METABOLISM IMPRINTED ON THE SKELETON*

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OBJECTIVE records of growing up fall into four groups which commend themselves to the logical and analytic mind.

First come the measures of fundamental capacity exemplified by the Seashore music tests of time, pitch, intensity, consonance, and rhythm. They are found also in life and action portrayed by graphic and plastic art. In these the learning span is very short indeed like that of the pecking and drinking instincts in pigeons.²⁰ Once learned in very early life they remain unchanged. How soon after birth they appear we do not know because there is a downward limit to their concrete expression.

Next come the measures of acquisitive capacity for which the environment of all children is practically uniform. These qualities are the functional basis of education. Their measures include the Binet and other tests of intelligence. Capacity in these follows the growth of brain, practically completed by the sixth birthday, as the organic basis of education. We do not send the child to school until growth and maturation of brain have reached the point when training and experience can be brought to bear, thus transforming capacity into ability.

Third are the measures of muscular skill which, essentially and at first, depends on intelligence but quickly, through repetition, becomes predominantly motor in pattern. Among these tests range themselves such measures as the Merrill-Palmer tests, tapping and steadiness, finger and hand dexterity, competitive athletics, and sports. In addition to the muscles themselves, both

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voluntary and heart, these involve priming by the cerebrum, associated movements presided over by the basal ganglia, steadiness dominated by the red nucleus complex, coordination aided by the vestibular mechanism, and strength and ease of effort governed by the cerebellum. They involve, in short, adjustment of response in time, in precision, and in effort. They reach their optimum in power, speed, accuracy, and grace during the third decade when bodily growth is completed, muscular development is stabilized and the heart is competent to cope with necessary strain.⁸ Since the heart continues to grow until the twenty-fifth year, this gives the lower limit of optimum expression. The upper limit is defined by the onset of cellular deterioration in the cerebellum, such as pigmentation in the dentate nucleus, soon after thirty years followed by loss or shrinkage of myelinated cerebellar fibers and disintegration and disappearance of Purkinje cells commencing at about the fortieth birthday.^{6, 7} A rational explanation is thus found for the ages of the several champions,^{14, 15} baseball, tennis, marksmanship, boxing, and amateur golf, between twenty-five and thirty years. Some, like outdoor tennis, may be a little in advance of this, others like professional golf a little later in life, but thirty years is the age of maximum efficiency in sport as in industrial occupation.^{18, 28}

In the fourth and last grouping are comprised measures of developmental growth and health in the soma itself, that part of the organism which obeys the command of the will. While the soma, it is true, includes the muscles which are dominated in their response by the central nervous system, we look for objective measures in this group to the skeleton, the connective tissues and the joints where the imprint of the chemistry of life, thanks to the discovery and perfection of roentgenographic method, is most clearly seen.

We recognize, as Janet¹¹ has insisted we must, the distinction between measurability and significance, and we strive to express the latter in terms of the former, meanwhile clarifying our problem before we devise our battery of measurements to be made.

The body is a complex of skin, soma, and organs. Each has its own pattern of developmental growth, growth meaning increment and development meaning maturation. In organs, functional maturity may antedate completion of growth, and they are geared to last our time. Skin has its own independent laws, and age changes occur in it without necessarily affecting the rest of the body. But the soma, that part of the body which obeys the will, must complete its developmental growth before its functional maturity is complete. Physicians by training are organologists and hence are little occupied with the problems of developmental growth. They have left the problems of the soma, with certain exceptions of injury and disease in bones and joints, to physical trainers, physiotherapists and even to persons less qualified to deal with problems which are, in their essence, equally within the realm of medicine as those of skin and organs. It is my desire to stress the applicability to the soma of quantitative and therefore scientific investigation which newer methods of approach have rendered practicable.

In an article now in press Miss Simmons and I have shown that human growth (i.e., stature) in well children is not a matter of alternate spurt and

slump as it has customarily been regarded but a steady annual progress in increment of diminishing velocity from birth to the second decade¹⁹ (Fig. 1). Properly analyzed, growth is the addition of increments in leg and in trunk length²⁴ of which the proportion in childhood is approximately 4:3. During

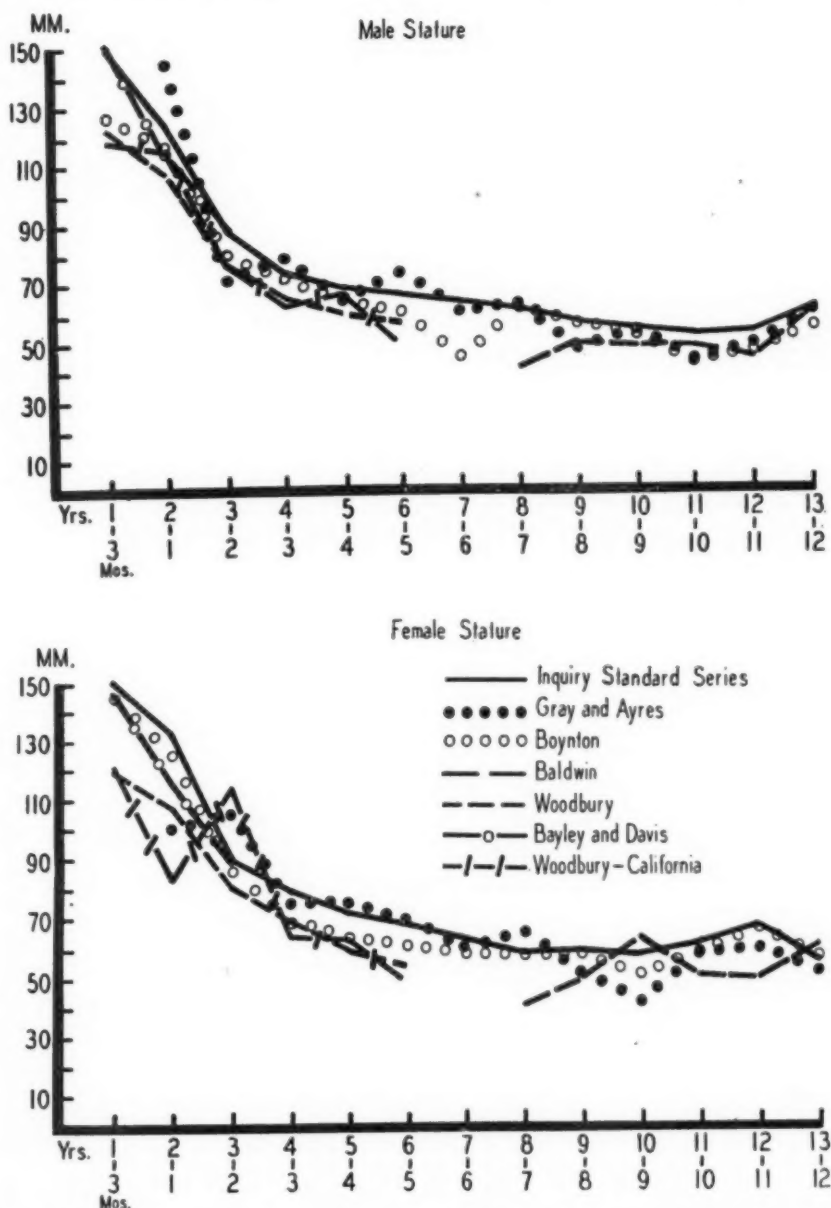


Fig. 1.—Comparison of curves showing increment in stature, male and female, from published samplings. Note the regularity of the unsmoothed Inquiry stature increment over annual periods from 3 months to 13 years. The regularity of this curve denotes the absence of spurts and slumps of increment (growth) such as are intimated by the irregularity of other curves of increment here recorded. (For further details see Simmons and Todd.¹⁹)

early adolescence, however, this proportion changes. Imminent union of the epiphysis at the upper end of the femur shortly before the fifteenth birthday in boys and soon after the thirteenth in girls shows that by these dates growth at the upper end of the limb must cease. Imminent union at the lower

end of tibia is apparent in boys between fifteen and sixteen years and in girls shortly before the fourteenth birthday. These dates determine the cessation of growth in the lower leg. There still remains the possibility of growth at the knee in lower femur and upper tibia until not later than the sixteenth birthday in boys and the fourteenth in girls. Thereafter, however, such increment in stature as may take place must be found in trunk. Assuming that growth is completed in the leg between fifteen and sixteen years in boys and a year earlier in girls we must ascribe the last two inches of increment in stature to the trunk alone. This growth also terminates at about the nineteenth birthday in boys and the eighteenth in girls. It is true that growth regulation does not occur with clocklike precision and that there is considerable individual variation, but the figures given are practically correct for well children in good constitutional health.²²

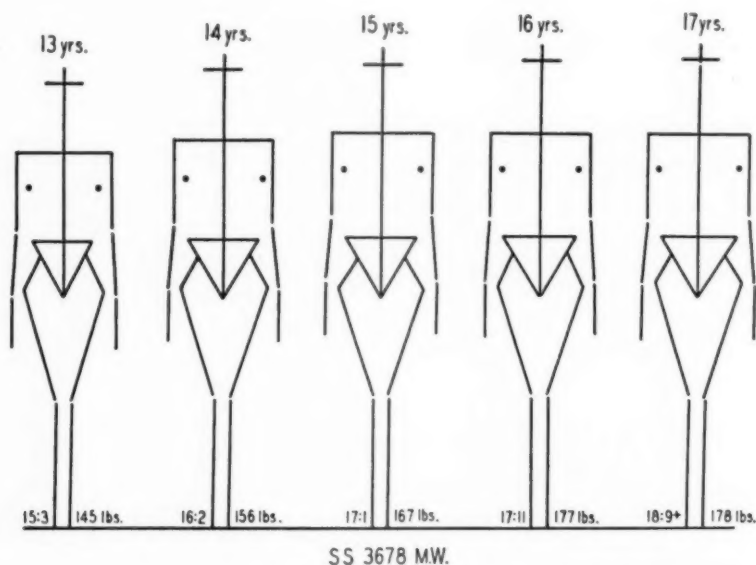


Fig. 2.—Growth in stature of a white boy (SS 3678) from 13 to 18 years. In physical maturation identified by roentgenography this boy was already at 13 years the equivalent of 15 years. Growth in leg had already ceased with imminence of epiphysial union in leg epiphyses. Thenceforward growth is evident in trunk alone. The figure to left of each mannikin indicates maturation age in years and months; that to right is the body weight in pounds.

Just how growth of the soma is delimited during the second decade, first in the leg and second in the trunk, is still a matter of conjecture. That it is related to the flushing of the body with sex hormones is certain, but the proper analysis of the process still awaits clarification. Dorfman, Greulich and Solomon are engaged now on an investigation of the relationship of sex hormone excretion to the degree of physical maturity.⁵ The problem is complicated first by the irregularity in daily excretion⁹ and secondly by the fact that one or more androgenic substances are present in human urine in part in a conjugated or combined form which awaits further analysis.¹⁷ The subject has recently been reviewed by Koch¹³ and a parallel investigation has been carried on by Dingemane, Borchardt and Laqueur.⁴ The relation of abnormal constitutional states of endocrine origin in which progress of somatic maturation is altered has also been investigated by Koch and his colleagues.¹²

Complex as the government of growth undoubtedly is, the morphological expression of this government is evident in a proper analysis of stature increment. As an illustration of this structural imprint the mannikins constructed from the anthropological measurements on a boy from our adolescent series on the Developmental Growth Inquiry is pertinent (Fig. 2). This clearly shows that after the cessation of growth in the leg, growth continues in the trunk in accordance with the program of growth outlined in a previous paragraph.

It is evident from allusions already made to the relationship of bone shaft to epiphysis that the imprint of chemical changes during adolescence is not limited to relatively gross and approximate features elicited by measuring growth increment but is even more neatly expressed in the maturation ratings derivable from study of the several diaphyso-epiphysial areas of the limbs.

These maturation ratings are recorded in the pattern of penetration by bony substance in the epiphysis resulting in progressive modification of contour, the last phases being reduction and final elimination of the diaphyso-epiphysial

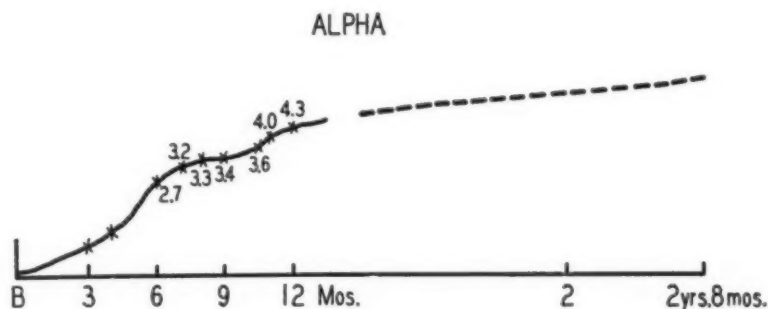


Fig. 3.—Progressive maturation identified by roentgenography in infant chimpanzee (see Jacobsen, C. F., Jacobsen, M. M., and Yoshioka, J. C.: *Development of Infant Chimpanzee During Her First Year*, *Comp. Psych. Monog.* 9: 94, 1932). The ordinates give maturation age in human years and months. Thus at a chronological age of 12 months the maturation age in terms of human development is 4 years 3 months. The dotted line indicates a slower tempo of maturation during the period intervening between the last observation on Alpha (Fig. 3) and the first on Claudius (Fig. 4). No observations have ever been made on physical maturation of the chimpanzee during this period. Undulations in maturation progress are associated at first with nutritional adjustment (about 3 months) and secondly (around 9 months) with clinical sickness.

plane through fusion of epiphysis with shaft. During the period when epiphysial bony contour is changing, modifications also occur in the contour of the growing end of the shaft. These are likewise utilized in the assessment of maturation, but the chief emphasis is upon epiphysial contour itself. Successive stages in this process have been described for the hand,²¹ and those for other skeletal areas will follow as funds permit their publication. They are not directly related to chronological age but can be arbitrarily assigned an age valuation which is essentially human in its implication since the valuation is based on maturation of the child's skeleton. The time relationship evident in Man naturally does not hold for other mammals, but the successive stages discernible in Man are common throughout the class Mammalia. Hence maturation in any mammal can be assessed in terms of human years. This provides a means of appraising relative maturation of the skeleton in any example of a young mammal. By way of illustration we examine the maturation pattern of

the Chimpanzee. The charts (Figs. 3 and 4) are based upon a study of the roentgenograms made during the first year of the female Chimpanzee Alpha's life, a privilege for which we are indebted to Professor Yerkes, and on our own male Chimpanzee Claudius from October, 1930, to December, 1936, when he had reached full skeletal maturity. From these it is apparent that skeletal maturation progresses with great rapidity during the first twelve months in the anthropoid ape. There is then a diminution in velocity until the animal has reached a maturation comparable to that of the child at six years. A second period of rapid progress then ensues so that at about the end of another twelve months the maturation has reached the stage attained by the child at twelve years. Thereafter progress continues at approximately the rate observed in Man to the completion of skeletal maturity.

The important point which we have to determine is how far skeletal maturation may be utilized as a measure of somatic development. Inasmuch as this

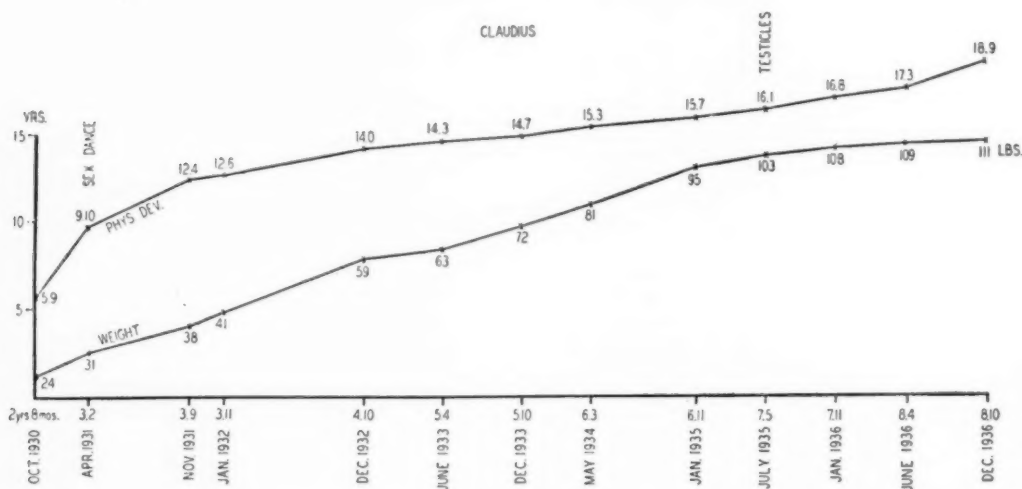


Fig. 4.—Curves of physical development (maturation identified by roentgenography) and weight (in pounds) of male chimpanzee Claudius from approximate chronological age of 2 years 8 months to date of union of all limb epiphyses (early adult stage). The figures on the physical development curve indicate successive stages in maturation assessed in terms of human years and months. In April, 1931, the sex dance first made its appearance. This is the beginning of gonadal domination (see Simmons and Todd¹⁰). By July, 1935, the rapid enlargement of testicles was observed. This coincides well with our observations on roentgenographic maturation of adolescent boys.

From Figs. 3 and 4 it appears that the chimpanzee shows two periods of rapid maturation; namely, infancy (first year) and "grade school period" (fourth year). Otherwise progress in maturation has a tempo similar to that of Man.

maturation, at least during adolescence, is associated with the sex hormones, it is natural to look to evidence of progressive sexual maturation for criteria. So far the criteria which can be applied are not quantitative. The menarche in girls and the rapid growth of the testicle in boys can be utilized. We find by experience that the menarche occurs in most girls at the time when skeletal maturation has reached a stage arbitrarily assigned as equivalent to thirteen and a half years. This skeletal stage is attained by boys at approximately the fifteenth birthday. It will be noted on the chart (Fig. 4) that testicular growth in Claudius was quite apparent soon after this stage was reached, precisely as we should expect if the general theorem holds true. Inasmuch, however, as

exceptions in onset of menses do occur, the relationship must be indirect. This also is what we might anticipate.

The menarche, it must be noted, is not synchronous with the attainment of fertility which is achieved during the period of trunk growth after leg growth has ceased.

Epiphysial union patterns comparable with those of Man have been worked out for ungulates²⁵ and rodents.²⁶ In these descriptions the work of Koch on the bison and of Dawson on the rat have been fully acknowledged. Zuck has recently described the pattern in the Guinea Pig.³¹ In none of these is the relationship of skeletal maturation to fertility specifically discussed. It is evident, however, that relative time relationships of successive stages in the pattern differ in different Orders and genera of mammals. From the fact that guinea pigs can be bred at three months but are preferably not bred until six months of age it appears that in a general sense the attainment of fertility corresponds roughly with a uniform stage in skeletal maturation in very diverse Orders. But the period corresponding to late adolescence in Man and the anthropoid ape is greatly extended in the rodent. Zuck points out that the pattern in the guinea pig at birth is the equivalent of eight human years and the pattern at eight weeks is the equivalent of that in a twelve-year-old child. But it is not until eighty weeks that the guinea pig pattern is the equivalent of seventeen human years.³¹

It is neither possible nor necessary to discuss in this lecture the wider deviations from the regular time relationship shown in victims of endocrine disorder. The imprint of metabolism in its broader sense on skeletal growth and maturation has been lightly sketched. Upon that as a basis we may, however, comment on certain general features of deviation.

The first point is the fact that whereas acceleration in the time relationship of skeletal maturation pattern is very rare, retardation is quite common. There is moreover no specific method of producing retardation. It may ensue from any interference with the normal metabolism of health.

Illustrative in this connection are our observations on the retardation of skeletal maturation following extirpation of the thyroid gland in sheep during their first month of life.²⁷ We have used this method to lengthen out the early stages in epiphysial maturation so as to note the precise order of sequence in union for the effect of disturbed metabolism, whatever its cause, is to delay but not prohibit progress. When the animal reaches the age of two years, however, pathologic features appear both in epiphysis and in growing end of shaft and, no matter how long the animal may live thereafter, further increment in growth and progress in skeletal maturation are stayed. The shaft has by this time reached the skeletal stage consonant with fertility and lambing is therefore possible. The significant deduction from this study is the time limit which is set upon both growth and maturation. It gives us a clue to the inevitable lack of success which must follow attempts at therapeutic promotion of developmental growth if this is delayed beyond the appropriate age.

The second fact to which attention may now be drawn is the influence of faulty nutrition in producing retardation of developmental growth. This is shown in the comparison of the protocols (Fig. 5) on guinea pigs deprived of certain nutritionals. For these I am indebted to my colleague, Dr. Milton B. Cohen. If the deprivation is extreme as in pig A-1, death ensues before deviation in the maturation pattern can occur. But if the deprivation is not lethal, as in pig A-14, a delay in maturation, similar in type but less in degree than that shown by the sheep, makes itself apparent.

This experiment helps us to understand what is happening to children undernourished from any cause. Weight is readily disturbed, growth less easily influenced but the time relationship of maturation clings with greatest

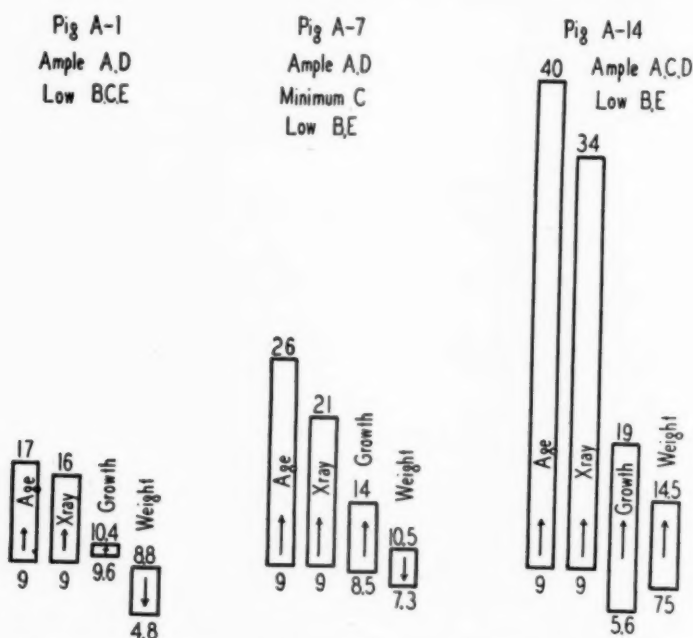


Fig. 5.—Typical registers of developmental progress from protocols of guinea pigs deprived of certain nutritionals (from unpublished work by Cohen and Todd). The experiment started when the animals were 9 weeks old. The lower figures for chronological age, roentgenographic maturation (Zuck's standards³¹) and length of limb bones (growth) register the assessments by weeks at the beginning of the experiment. Corresponding figures for weight are inscribed at the tail of the arrows. Upper figures indicate the assessments at death except for weight which is noted in the figures at the head of the arrows.

In A-1 health was so broken that growth was stayed and life quickly terminated. Maturation was scarcely affected.

In A-7 the retardation of both growth and maturation is evident.

In A-14 life was prolonged, growth markedly retarded and maturation considerably delayed. This animal represents in exaggerated fashion the influence of defective nutrition in children.

tenacity to its pattern. The safest and most convincing evidence of malnutrition lies not in weight or stature which may be equivocal in their evidence but in the true relationship of skeletal maturation which is independent of increment in growth.

The third and last point to be noted here is the erroneous inference which may be drawn from the effect of improving nutrition in a malnourished animal. We have seen in children on the Developmental Health Inquiry that raising the vitamin D ration or thyroid therapy apparently rapidly increases temporarily the maturation rate. This is a spurious effect resulting from deposit

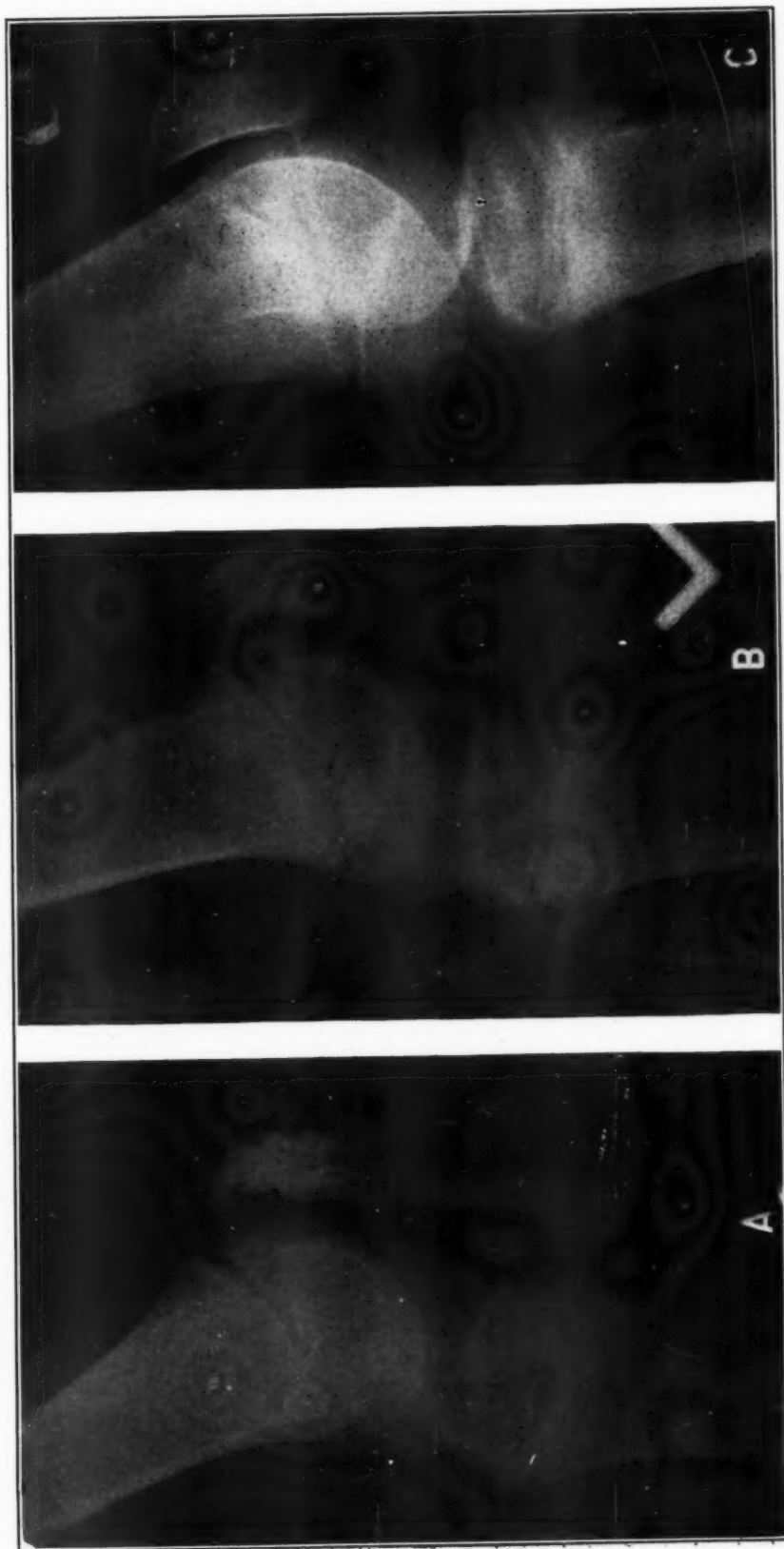


Fig. 6.—Roentgenographic register of change in bony texture of patella under appropriate therapeutics (Zuck²⁰). SS 2895, male, white, chronological age A 15 years 4½ months; B 16 years; C 16 years 6½ months.

of mineral in epiphysial tissue which, in the malnourished state, was unprepared to receive the mineral.²⁹

We must now pass on to consideration of the texture of the skeleton as a register of health. The features to be reviewed are scars, scorings, osteochondrosis, and textural modifications such as halisteresis, trabeculae, and knots.

Although these features have just been mentioned in descending order of their obviousness, it is logical for us to consider osteochondrosis first. This appears as a modification in texture of ossification but is due to an alteration in pre-osseous cartilaginous tissue which brings about a striking alteration in the manner of deposit of bone salts. It has been associated, by assumption more than by analysis, with epiphyses subjected to the strain of muscle pull, and it is certainly most frequently observed in the patella so that the inference is natural

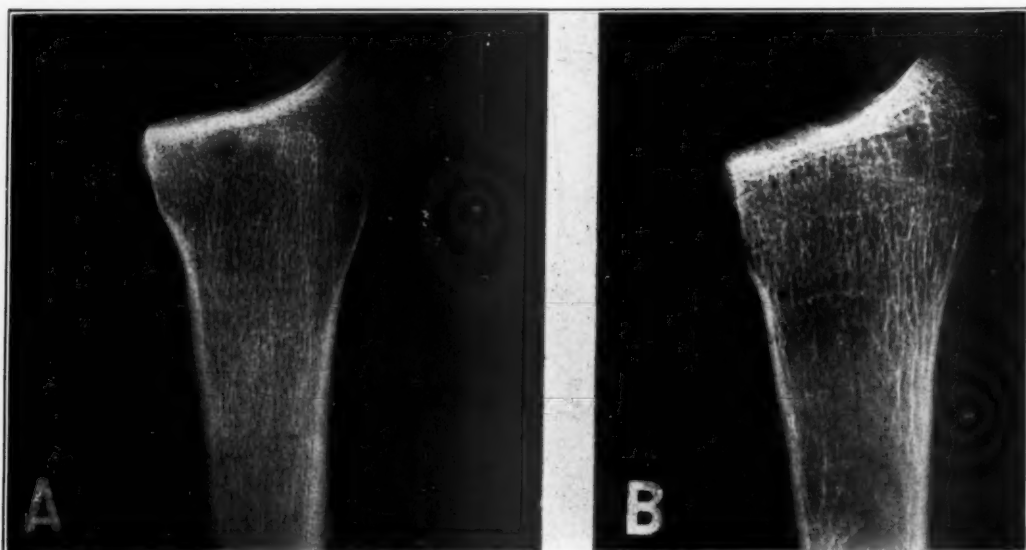


Fig. 7.—Roentgenograms of lower end of radius in male white cadavera. A, No. 680, age 23 years, cause of death pneumonia; B, No. 423, age 24 years, cause of death typhoid fever, irrelevant in government of mineralization. The fine trabeculae and close texture in A are characteristic of good mineralization. The coarse trabeculae and open texture of B are equally characteristic of moderate but relatively irreversible halisteresis.

though unwarranted. As a matter of fact osteochondrosis is most frequently seen in bony centers which appear relatively late in childhood. But it is also found more rarely in centers which appear in early infancy such as capitulum of humerus and capitate of wrist or in late fetal life such as calcaneus and head of humerus. The irregular cauliflower like contour and amorphous or at least nontrabecular texture are characteristic. Its frequency in the calcaneus has been studied by Dr. Gibbons.¹⁰ Despite the very marked distinctions in textural appearance from that of healthy development, transformation to the normal texture can occur with relative rapidity, and this gives rise to the impression that we are dealing with a pathological condition susceptible to therapy. It seems more probable that we have here visualization of the rapid change undergone by the connective tissues when their local nutritional state is modified, the bony tissue itself having so rapid a turn-over that it adds no impediment to the

process.² The rapidity of change and conditions under which improvement of bony texture may be observed have been discussed by Dr. Zuck³⁰ (Fig. 6).

Allied to the change in collagenous matrix just mentioned is fluctuation in mineralization of bony texture. That cancellous tissue, and indeed compacta, may be drawn upon for mineral to be utilized in somatic growth or metabolism has been definitely proved by Bauer, Aub and Albright.¹ The significance of vitamin D in the distributing mechanism has been outlined,²⁹ but the distinction between reversible and irreversible phases of the process has hitherto been obscure. It is our experience that halisteresis is merely a reversible phase in infancy,¹ in adolescence, in pregnancy, and in the postpartum state. Relative irreversibility is characteristic in the halisteresis of childhood or adult life, or



Fig. 8.—Example of progress in halisteresis. Left hand, SS 3858, male, white, age *A* 3 years 6 months; *B* 4 years. The aluminum density gauge registers identity of processing technique validating the comparison of these roentgenograms. Knots faintly visible in the trabecular pattern, particularly of carpal bones, in *A* are larger and more numerous in *B* as halisteresis progresses.

that which accompanies profound modification of somatic tissues such as occurs in children with blue sclerotics, great retardation in the maturation pattern not amenable to therapy, growth deformities like chondrodystrophia and marked endocrinopathies. While appraisal of mineralization is practicable by roentgenographic methods, one is liable to serious error if the distinction in trabecular pattern between reversible and irreversible phases is not made.²³ Fig. 7 illustrates this point. The cancellous tissue in No. 680 is composed of fine trabeculae closely set so that the very interstices appear to have a gray haze. This is typical of good mineralization. But in No. 423 the interstices are larger and clearer, trabeculae are coarser. It is not implied that the features shown

in No. 423 are necessarily irreversible but only that they illustrate the characteristics of the more intractable phase.

Stages in the transformation of one phase into the other are illustrated by Figs. 8 and 9. Rarefaction of cancellous tissue and increase in trabecular thickness go together. Early in the process trabeculae take on a beaded or knotted appearance especially well seen in the short bones of the wrist.²³

Osteochondrosis, rarefaction of cancellous tissue or compacta, changes in trabecular structure by fragmentation, beading or general thickening, even the condition known as marble bones, signify modification of collagenous matrix with consequent changes in bone salt adsorption.



Fig. 9.—Example of temporary or definitely reversible halisteresis characteristic of adolescent growth. SS 4008, male, white, age *A* 10 years; *B* 12 years. The loss of gray haze in interstices of trabeculae in *B* is the first stage in halisteresis. The actual loss of trabeculae in epiphysis of lower end of radius in *B* is the next stage.

The structural peculiarities known as scars and scorings belong to a different category. These register quite temporary local interruptions of growth not general metabolic modifications of considerable duration.

Of the two the scars are the more apt to be present over a number of years (Fig. 10) and may even be permanent. They were described by Park and Howland as transverse lines.¹⁶ Each is produced by a definite clinically evident disturbance in health. Nevertheless the fact that they originate in a metabolic disturbance of short duration such as the height of a fever, the occurrence of

injury or the constitutional shock of an anesthetic permits their utilization as calibration lines from which to measure increments of growth provided they are not so numerous as to imply impediment to the regular velocity of growth.

Scorings are always more numerous and more transitory than scars. They give the impression of watered silk markings (Figs. 11, 12). They register minor and usually subclinical disturbances of health. Like scars, they have no diagnostic significance other than disturbed metabolism. But their occur-

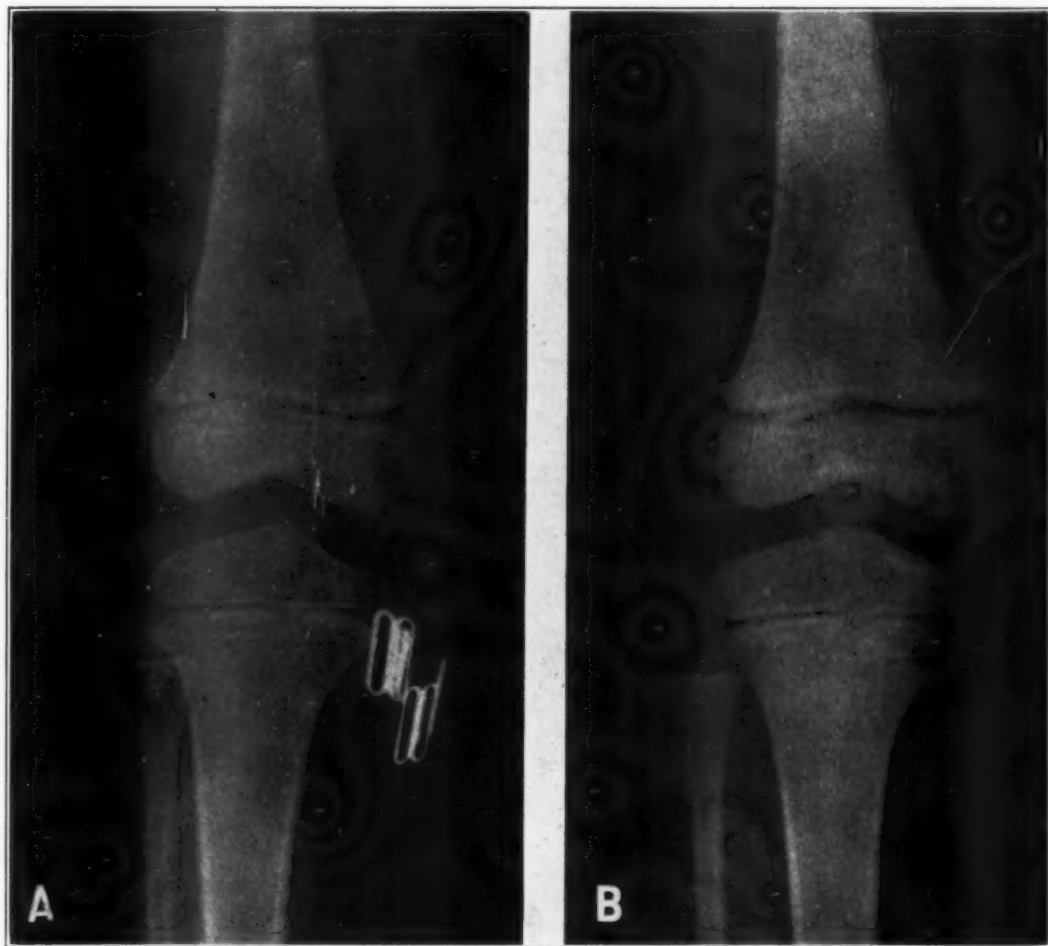


Fig. 10.—Roentgenograms of left knee, SS 928, male, white, age *A* 5 years; *B* 6 years. Note in *A* the scar recording a tenotomy performed 6 months previously. This scar is present a year later in *B* though fainter, thinner, and now interrupted in continuity. A new scar appears between the old one and the articular surface of tibia. This was produced by an attack of measles 9 months before roentgenogram *B* was made.

rence in any particular health defect being granted, their fleeting character gives objective evidence of the fluctuations in the progress of that particular disorder. The frequency of these scorings in allergic disturbances has been presented by Cohen and Friedmar.³ They appear in many other illnesses but seem to have a common character of being mediated by gastrointestinal disturbance. When, for example, the allergy is manifested solely in the respiratory passages scorings do not occur.



Fig. 11.—Scars and scorings on lower tibia indicative of periods of ill health. SS 3858, male white, age *A* 2 years; *B* 2 years 6 months. The single white line scar in *A* is the result of tonsillectomy 8 months previously. This appears further up the shaft in *B*. A second white line is now present due to measles 6 months earlier. On the tibial shaft adjoining these scars are finer multiple scorings not very well reproduced in the illustrations but indicative of repeated gastrointestinal disturbances resulting from masked food allergy despite treatment. Compare the scorings on the untreated case in Fig. 12.



Fig. 12.—Scorings on lower tibia from an untreated case of gastrointestinal allergy. SS 3158, male, white, age 4 years 6 months. By comparison of this figure with Fig. 11 the effect of appropriate treatment can be gauged.

SUMMARY

1. In this address I have sought to summarize our understanding and our expectations on the imprint registered on the skeleton by fluctuations in and by more profound and prolonged deviations from metabolic integrity. The registers are growth increment, skeletal maturation and bone texture. Deviations are represented more frequently and more markedly by defect than by accentuation. Each has its reversible and irreversible phases; irreversibility in growth and maturation being determined in time by well-recognized though imperfectly understood factors, but irreversibility in texture as yet quite obscure in its relation to duration or to manner of determination.

2. Somatic tissues bear the impress of metabolism because they carry the reserves to be drawn upon for growth, maturation, and maintenance of efficiency in that part of the body which obeys the will. By appropriate techniques each component in this closed system of tissues and plasma may be appraised. The most readily assessable is the skeleton which determines the direction and linear dimensions of somatic growth, reflects the progress of somatic maturation, and registers in its texture both demands made by metabolic need and the interruptions inflicted in metabolic disturbance.

3. It is the objective registration possible in somatic tissues which guides the physician whose clinical examination has proved the organs sound, in planning a daily regime of health habits of nutrition, exercise, vocational application, and social undertaking which is the object, conscious or subconscious, of every man or woman who requests a periodic physical examination as a protective measure in keeping efficient and fit.

4. Most of the indicators discussed in this address have special application to childhood, for they register velocities in growth and maturation, demands upon resources and temporary disturbances in health. Some textural indicators, however, are equally applicable to both the child and the adult for they register resources in mineral reserve and the balance between labile and fixed components of that reserve.

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FACTS AND FANCIES IN ORTHODONTICS

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IT HAS been stated that a well-chosen slogan can retard progress for as much as half a century. This is as true in the field of orthodontics as in any other field of endeavor. If progress is to be made, it is important that our texts and our scientific journals make every effort to maintain a scientific attitude. The casual statement should be discouraged, and every effort should be made to substantiate all statements with scientific evidence. It is especially important that men associated with teaching institutions and scientific publications should be conservative in their remarks and in the adoption of new ideas. It is indeed a difficult task to be conservative and to avoid adherence to outworn concepts at the same time. Difficult as it is, however, that is the function of teachers and of those associated with editorial staffs. It is but natural that the members of the profession should assume that men in these positions are authorities in their particular fields.

In a review¹ of Miller's textbook, *Oral Diagnosis and Treatment Planning*, in the March, 1938, issue of *AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY*, reference is made to the chapter on "Diagnosis in Orthodontia." The statement is made (p. 292), "Exception may be taken to Fig. 21 (our Fig. 1), a diagram which illustrates bone resorption on the labial and bone deposition on the lingual wall of the alveolus if 'gentle intermittent pressure' is applied in a labial direction. Under the influence of the appliances suggested (non-bodily), the bone changes at the apex of the tooth occur in manner and direction opposite to those at the alveolar border; which factors, together with their occlusal components, are inadequately if not incorrectly demonstrated in the diagram.

"In the treatment of Class III conditions, too much pessimism is evidenced by the author's belief that such malocclusions cannot be corrected because tension stresses would be needed to reduce the size of the mandible and 'tension will destroy bone.' There is no support for this latter statement; as a matter of fact, tension stimulates bone growth, does not destroy it. Questionable also is the author's statement that 'it is not possible to reduce the size of a bone after it has grown, except by surgical intervention. This refers to the bodies of the maxilla and mandible.' There is no line of demarcation between alveolar process and jaw bone proper, but the trabecular structure is continuous. The alveolar process supports the teeth and changes with them, but the body of the jaw bone supports the alveolar process and changes with the latter. All tooth movements have a far-reaching effect and skull measurements as well as radiographic studies show that the jaw bone proper and the ramus of the mandible are affected by orthodontic treatment. Class III malocclusions have

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frequently been treated with good success, especially if endocrine factors were properly taken into consideration."

This review makes some very specific charges and implications *without authority*. I shall enumerate them and discuss them in sequence *with authority* for each statement:

1. "Under the influence of the appliances suggested (non-bodily), the bone changes at the apex of the tooth occur in manner and direction opposite to those at the alveolar border; which factors, together with their occlusal components, are inadequately if not incorrectly demonstrated in the diagram."

With regard to the situation of the tilting axis in tooth movement with orthodontic appliances, I quote Oppenheim, p. 77²:

"Microscopic investigations in my animal material disclosed no pressure or traction-sphere at the apex after application of gentle intermittent forces. The unaltered condition in the apex and the changes becoming more obvious to-

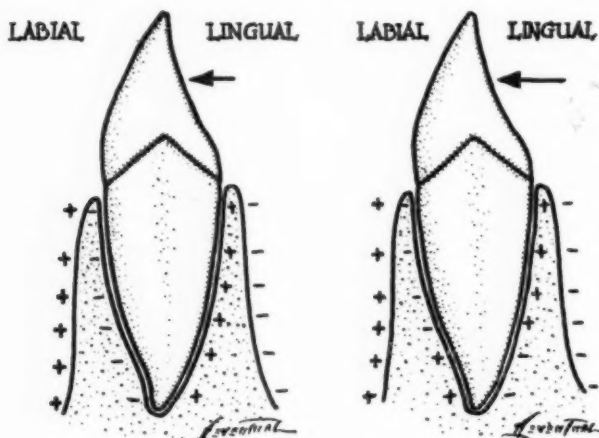


Fig. 1.—Gentle, intermittent pressure applied in the direction of the arrow to a mandibular incisor would stimulate bone development. Bone would be formed in the regions indicated by a plus sign and would be removed in the regions indicated by a minus sign.

ward the alveolar crest supported my opinion that in these gradually produced tiltings we have to deal with a one-armed lever, *if the movement of the tooth goes on so slowly that it keeps pace with the starting resorption*. Under this condition, my supposition was correct, as I stated for the last time in the *INTERNATIONAL JOURNAL OF ORTHODONTIA*, 1934, p. 253. 'The fulcrum in a tipping movement is located at the apex, if such gentle forces are applied that bone resorption can keep pace with the movement of the tooth.'

"The human specimens show the *impossibility to perform tooth movements in such a way as to imitate* the natural movement of the tooth. 'Under physiologic conditions the point of entry of the blood vessels and nerves at the apex is never disturbed. Regardless of the changes that may occur in the position during the physiologic processes of growth and movement, the apex will remain stationary.' (Oppenheim, *Int. J. Orth.* 1934, p. 254.)

"'If we move a tooth in such a way that we cause a tipping of that tooth, it is evidence that we are moving it more rapidly and producing changes faster

than normal development can take place; we are establishing another disharmony in the functional adaptation of teeth and tissues.' (Mershon.)

"No deviation of the apex in monkeys could be ascertained after forty days of force application. In the human specimen, not even after fifty-two days (seven and one-half weeks) of equal force application (Cases I and II) and Case V, where very gentle force was applied, after one hundred and fifteen days (sixteen and one-half weeks) no deviation of the apex was to be ascertained by the microscope. According to such findings, the tilting axis must be located at the apex and for these cases a one-armed lever must be assumed.

"But a deviation of the apex can always be ascertained if, in the application of the same amount of force, this period of time has been exceeded and the influence on the tooth has lasted longer than eight to ten weeks. The formation of some kind of fulcrum has occurred. That, as previously stated, cannot be evaded. Finally a two-armed lever is established with visible deviation of the apex to the opposite side of the crown movement.

"If no deviation of the apex is discernible in the slides, owing to the lack of corresponding periodontal space and bone, we have in the cementum resorptions, which inevitably occur at points where the physiologic pressure has been exceeded, the infallible indication of tipping.

"The development of a two-armed lever could only be avoided if the periods of active treatment were limited to seven or eight weeks and then interrupted for an interval of rest. During the rest period the reparation of the tissues makes such good progress that normal conditions of the tissues can again be reckoned with, which permit a new influence of appliance application for another seven or eight weeks. How long the intervals of rest should be, cannot be said today, as we have, as mentioned previously (Angle Orthodontist 6: No. 1, pp. 36, 37), no fixed indications as to the time necessary for certain healing processes. The efforts for 'biologic treatment' should aim at maintaining the one-armed lever under all circumstances, for the deviation of the apex must be considered as a pathologic appearance."

2. "In the treatment of Class III conditions, too much pessimism is evidenced by the author's belief that such malocclusions cannot be corrected. . . . Class III malocclusions have frequently been treated with good success, especially if endocrine factors were properly taken into consideration."

In the chapter on "Diagnosis in Orthodontia," p. 385, the following statement is made:³ "In Class III, there is an overdevelopment of the body of the mandible. These cases must not be confused with Class I cases in which the mandible is normal in size but the maxillae are underdeveloped. In the Class I cases just mentioned, stimulation for the development of the upper jaw, particularly in the anterior region, is sufficient to correct the malocclusion. Another type of Class I that is readily mistaken for a Class III is that type in which, because of a lingual inclination of the upper incisor teeth, the patient is compelled to seek a functional occlusion by protruding the lower jaw. Models alone of a case of this type will not reveal the true condition. An examination of the mandibular excursions will show that the patient can readily bring the incisors into a tip-to-tip occlusion, but that the posterior teeth will not occlude. In these cases, slightly tipping the upper anterior teeth labially will permit the lower

anterior teeth to occlude lingually to the upper anterior teeth and the patient will no longer be compelled to protrude the lower jaw to seek a functional occlusion.

"In Class III, it must be remembered that there is always an overdevelopment of the body of the mandible. The upper jaw may be normal or subnormal in size. If the upper jaw has been retarded, it is necessary to stimulate it

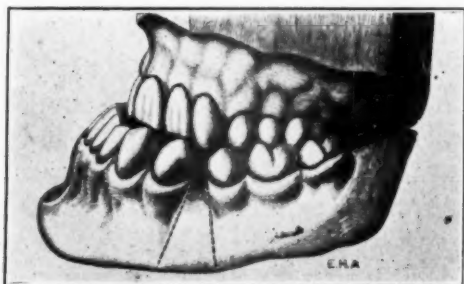


Fig. 2.—Angle's illustration to show the site for resection when the body of the mandible is overdeveloped.

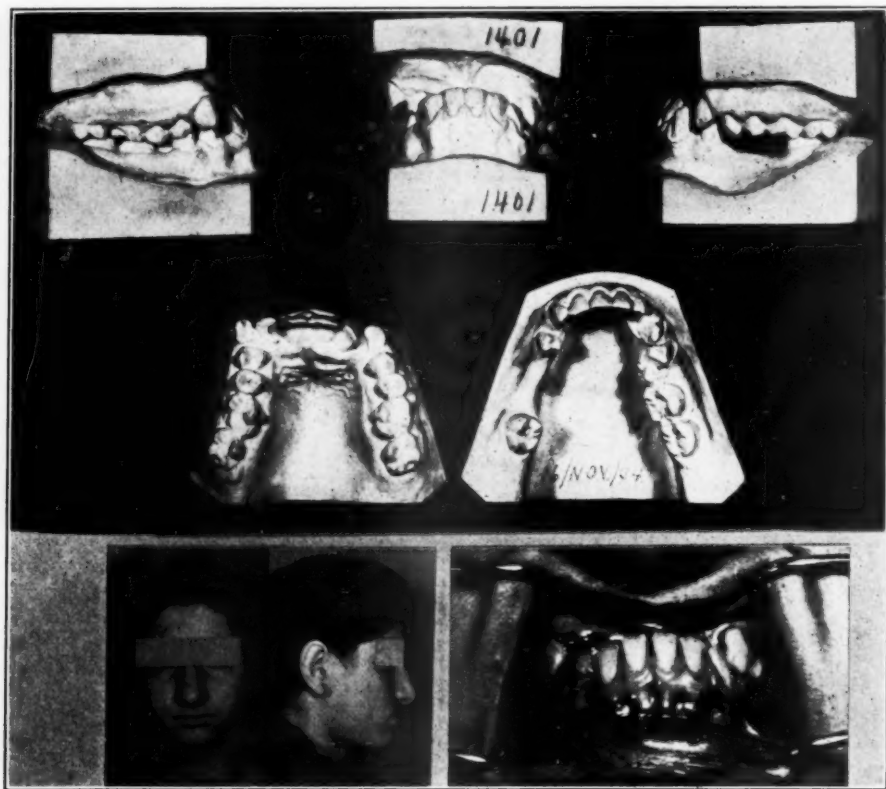


Fig. 3.—Casts and photographs of a Class I case that simulates a Class III. Before treatment.

to its normal size so that all of the upper teeth may be accommodated. When that has been achieved the patient will have the best occlusion that is possible under the conditions."

In addition it is stated that, "It is possible to stimulate the development of bone, but it is not possible to reduce the size of a bone after it has grown, except by surgical intervention."

With regard to the first part of this statement made in the chapter on "Diagnosis in Orthodontia," it is interesting to note that in 1899, in the article entitled "Classification of Malocclusion," Angle⁴ said: "The inharmony in the size of the arches is usually due to the inharmonious development of the maxillary bones, the angle of the lower jaw being more obtuse than normal

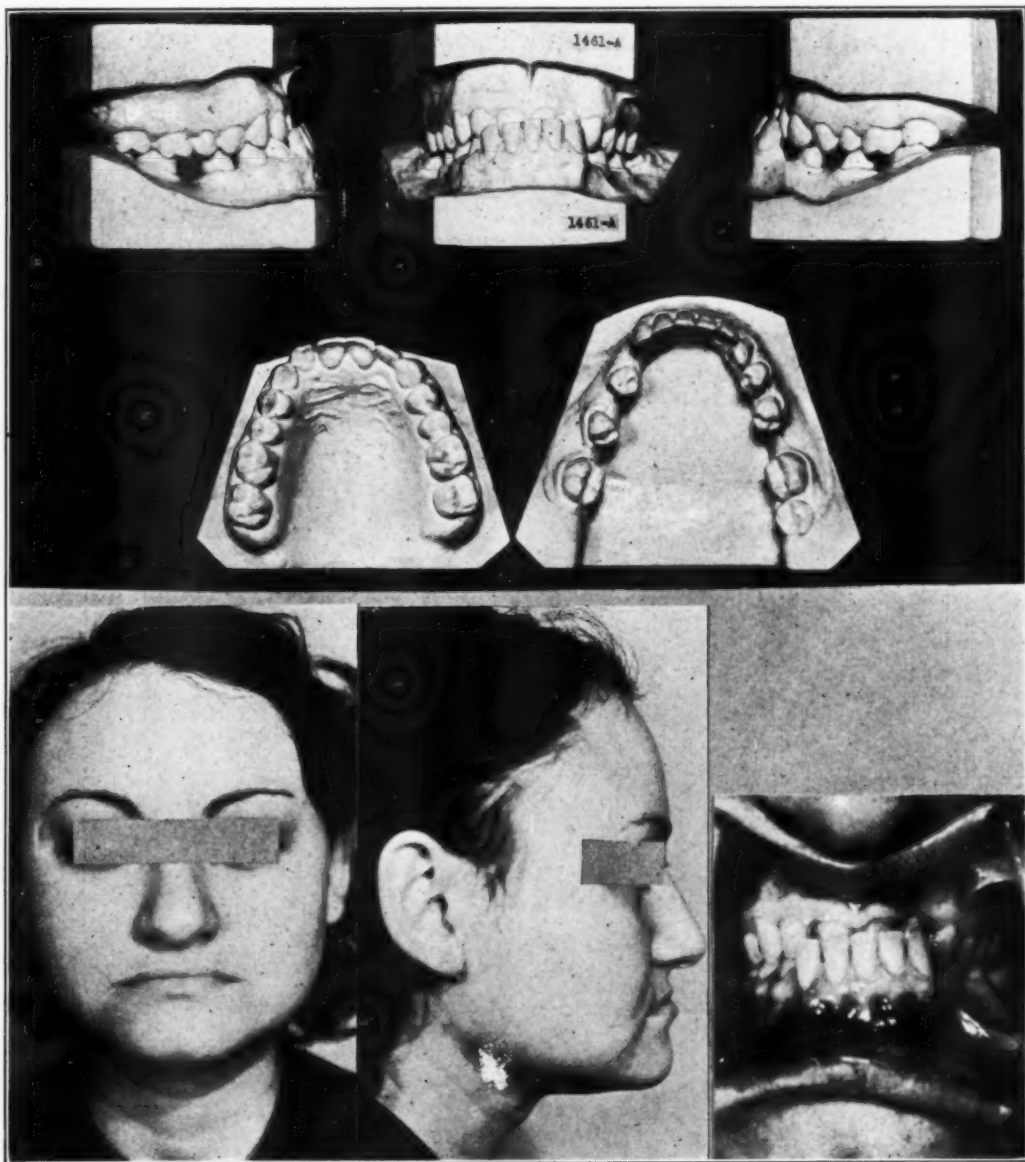


Fig. 4.—Casts and photographs of a Class I case that simulates a Class III. Before treatment.

or it may be the result of overdevelopment in the body of the jaw. Occasionally cases are met with where there seems to be overdevelopment in certain localities of the body, as in Fig. 17 (our Fig. 2). Another model in the author's collection shows local overdevelopment of both the lateral halves between the bicusps, one space being greater than the width of one bicuspid, the other not quite so great.

"In other cases met with the jaw seems to be normal in form, the protrusion apparently being caused by the temporomaxillary articulation being farther anterior than normal, this probably being due to the gradual sliding forward of the condyles and to modifications of the fossae."

It should be noted that Angle himself as far back as 1899 made the distinction which I emphasized between Class III cases in which there is a normal growth of the body of the mandible and Class III cases in which there is overgrowth of the body of the mandible. In order to clarify the classification I emphasized in my text the fact that "An examination of the mandibular excursions will show that the patient can readily bring the incisors into a tip-to-tip occlusion but that the posterior teeth will not occlude."

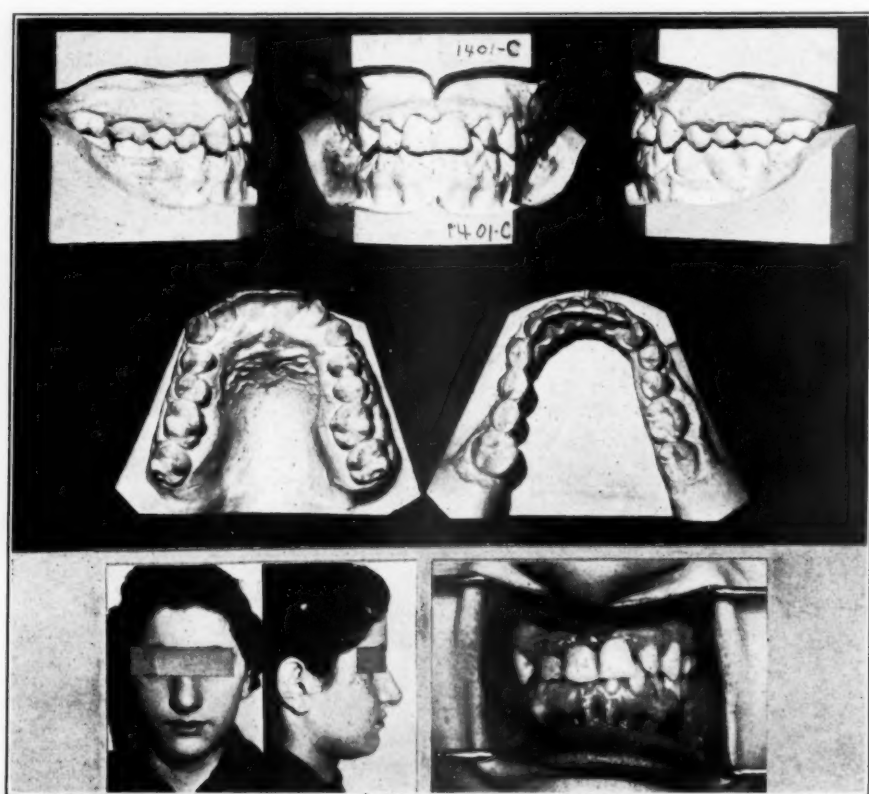


Fig. 5.—Case shown in Fig. 3, after treatment.

In these cases in which the patient has been compelled to slide the condyles into a forward position in order to establish a functional occlusion and in which a harmony in the size of the arches can ultimately be attained, I prefer not to use the designation Class III. I have specifically stated that, "In Class III, there is an over-development of the body of the mandible." In cases in which there is a relatively normal development of the body of the mandible, I prefer to consider the case as a Class I case in which a functional adaptation has caused the appearance of the Class III. *It is specifically in reference to cases in which there is actual overdevelopment of the body of the mandible that I stated that orthodontic stimulation cannot cause the reduction in the size of the body of the mandible.*

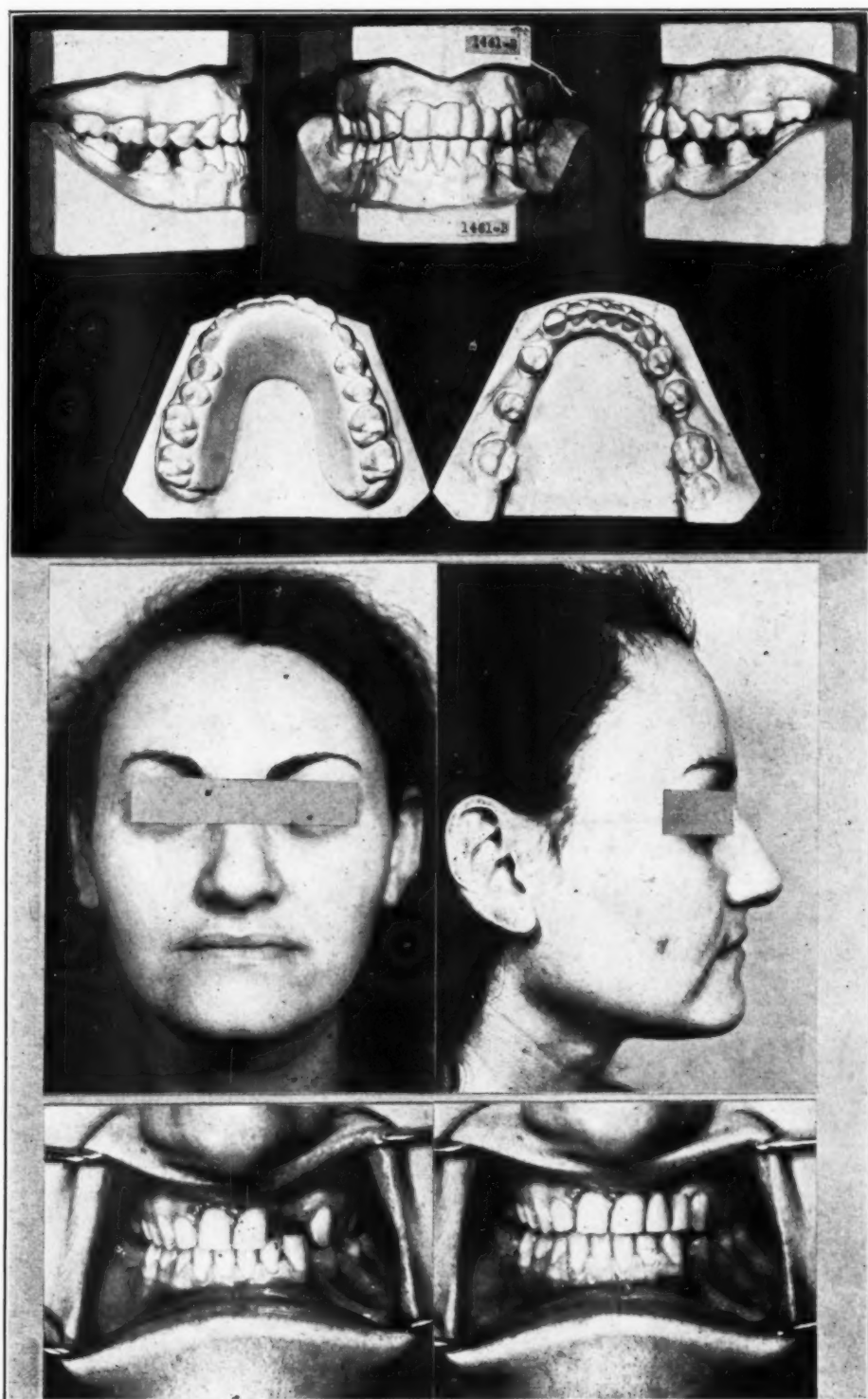


Fig. 6.—Casts of case shown in Fig. 4, after treatment, with a temporary restoration in position. Full face and profile of patient after treatment. Tooth views of case after treatment, without and with a temporary vulcanite restoration in position.

Figs. 3 and 4 show two cases which simulate Class III. It will be noticed that in each of these cases it is possible for the patient to bring the incisor teeth into a relatively tip-to-tip position without the aid of orthodontic treatment. When the teeth are in tip-to-tip relationship, there is a normal appearance of

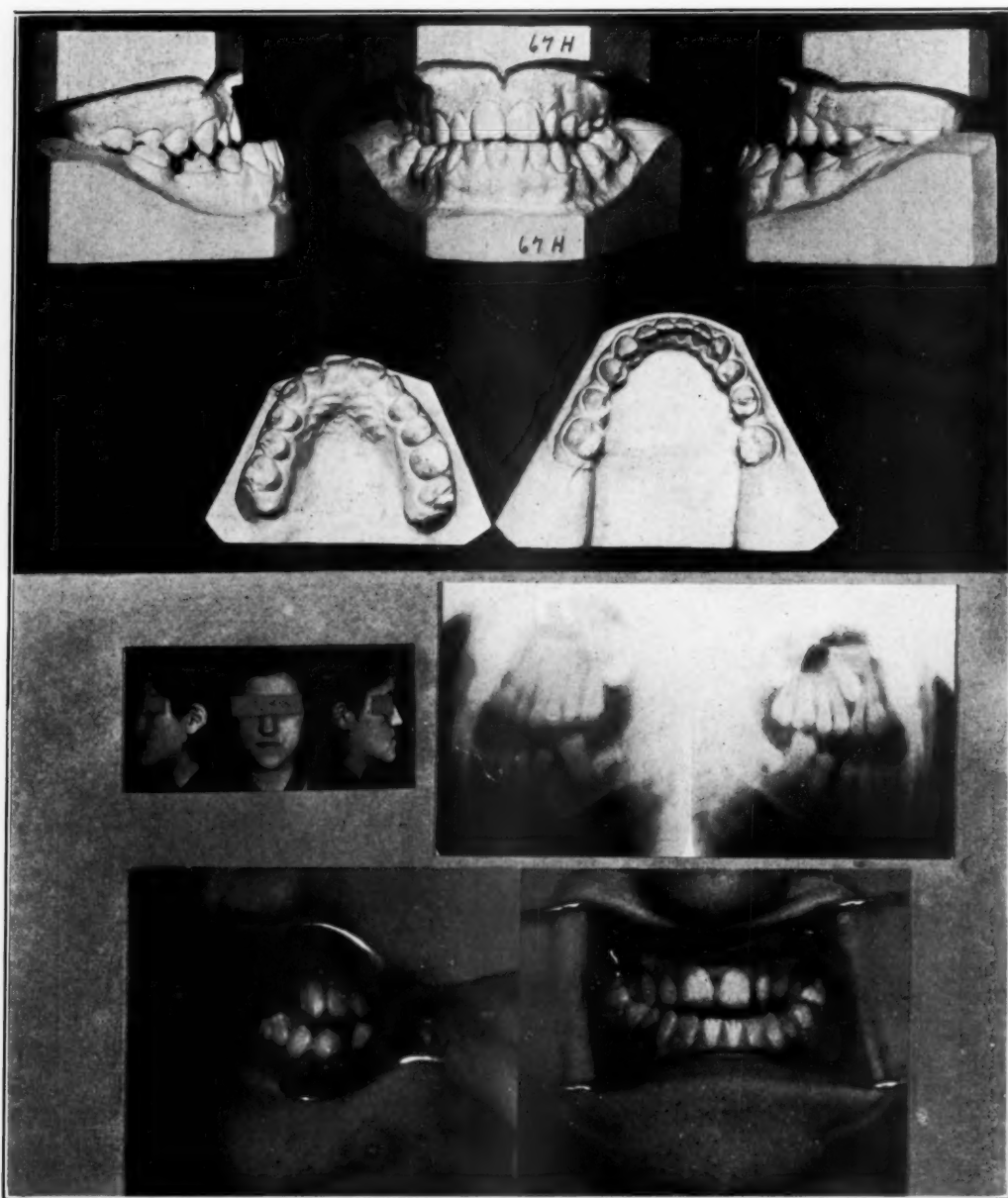


Fig. 7.—A Class III case of malocclusion associated with an impaction of the maxillary left canine. There is no room between the maxillary left lateral incisor and the maxillary left first premolar. The maxillary right first permanent molar had been extracted. There is a marked overdevelopment of the body of the mandible in spite of the fact that the two mandibular first permanent molars are missing.

the face, the x-ray pictures show the normal position of the condyles in the glenoid fossae, and there is no evidence of overdevelopment of the body of the mandible. In a relatively few months both these cases were corrected, as can be

seen in Figs. 5 and 6. These cases are not classified as Class III in the text but are referred to as Class I. It is stated in the text that "Another type of Class I that is readily mistaken for a Class III, is that type in which, because of a lingual inclination of the upper incisor teeth, the patient is compelled to seek a functional occlusion by protruding the lower jaw. Models alone of a case of this type will not reveal the true condition."

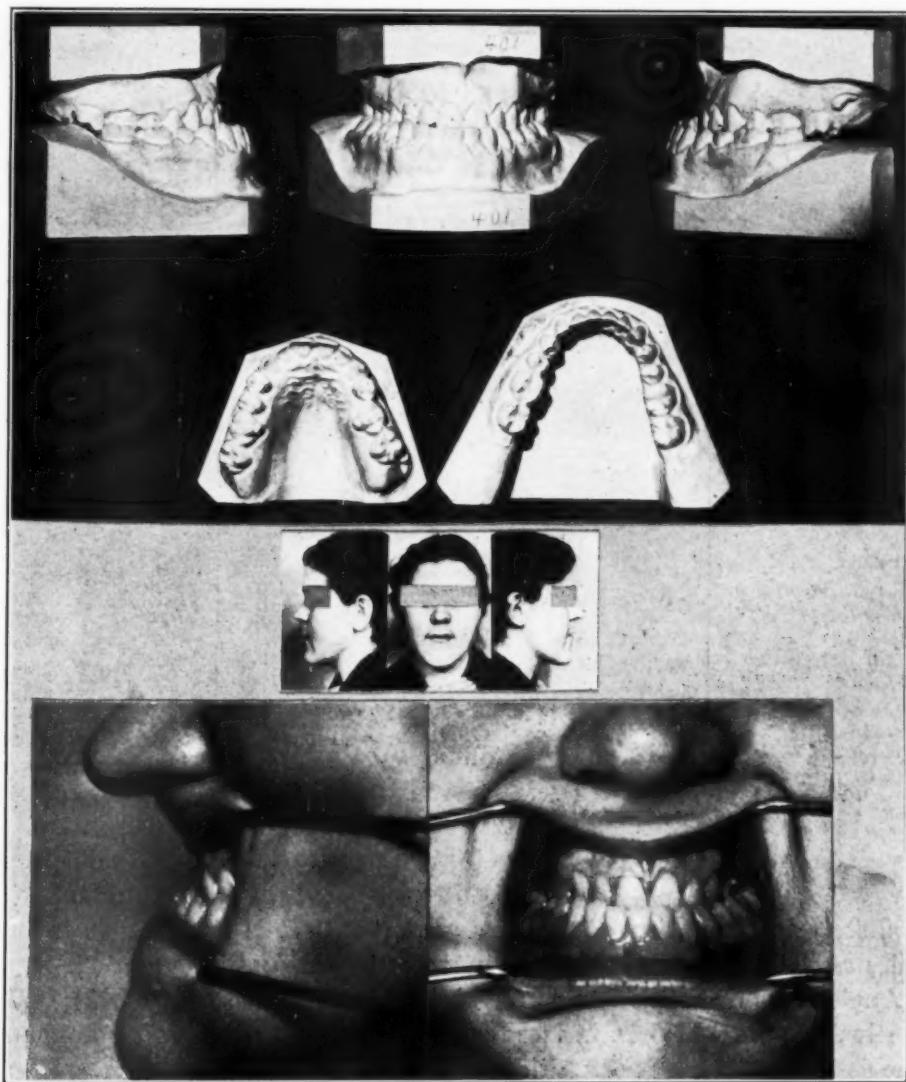


Fig. 8.—A Class III case of malocclusion. The maxillary left second premolar is impacted.

There are, however, conditions in which there is a very definite overdevelopment of the body of the mandible which may be associated with a lack of development in the maxilla, but it is not essential that this lack of development be present in the maxilla. Figs. 7 and 8 illustrate a few of these cases.

It is interesting that in most of the textbooks that have been written on the subject of orthodontics, illustrations that Angle used as far back as 1899 are shown, or at times merely diagrammatic representations of *these* Class III cases

are used in chapters devoted to the treatment of Class III cases. However, *no textbook and no scientific journal that has ever come to my attention has demonstrated one of these cases successfully completed.*

The case shown in Fig. 8 was treated in our own institution for a number of years. Fig. 9 is the plan of treatment that was instituted, and it will be observed it is a survey made according to Stanton's⁵ ideas of arch predetermination. The survey, however, does not take into consideration the characteristics of bone growth, and we found that after three years of treatment the mandible was actually larger than before. The patient was then advised to submit to a mandibular resection. She refused, however, and discontinued treatment. In this case, in addition to the routine orthodontic appliances that were used, extra-oral anchorage was used with the chin cap as was advocated by Angle many years ago.

If Class III malocclusions in which there is a definite overgrowth of the body of the mandible have frequently been treated with good success, I think that the individual or individuals who have such cases to demonstrate owe it to the profession to report them.

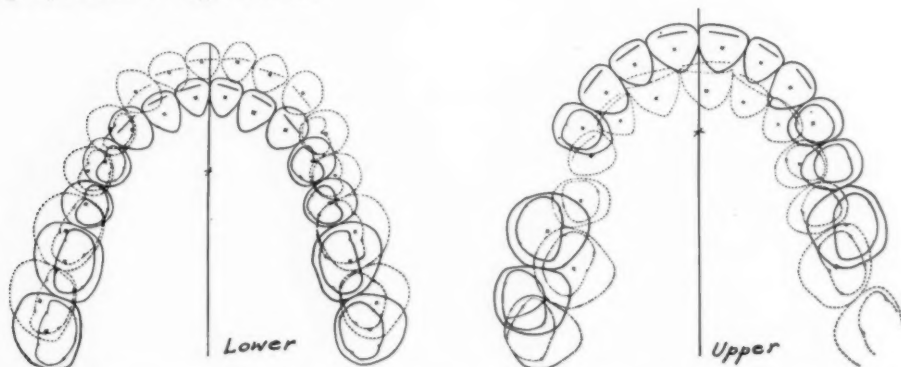


Fig. 9.—Surveys of the plan of treatment in accordance with Stanton's method of arch predetermination. The dotted outlines are the positions of the teeth in malocclusion. The heavy lines are the proposed positions for the teeth.

Very interesting is the statement of the reviewer that success in the treatment of Class III is frequent, "Especially if endocrine factors were properly taken into consideration." It should be remembered that this statement follows immediately his quotation of the statement that, "It is not possible to reduce the size of the bone after it has grown except by surgical intervention."

Angle recognized this fact as far back as 1900. He says⁶ (p. 268), "As the malocclusion (Class III) is, in most cases, due to the asymmetrical development of the jaw bones, our opportunities for improving the occlusion by working on the teeth alone are, in many cases, greatly limited, and are usually diminished in proportion to the age of the patient.

"These cases are nearly always progressive, and if treatment is begun very early much may be accomplished; but if delayed until maturity, when the bone has become dense and fully formed, we are powerless to materially improve the conditions by ordinary methods, and are limited to the operation of double resection of the lower maxilla."

He continues (p. 270) to say, "In employing the first plan (retraction of the inferior maxilla) the position of the lower jaw is modified by the use of the

chin retractor and occipital anchorage, as shown in Fig. 270 (our Fig. 10). Where much may be accomplished by this method if employed while the patient is young and the bone yielding, little can be hoped for in its use after the age of fifteen."

Even the most ardent advocate of endocrinology in the field of orthodontics or in the field of endocrinology would hesitate to promise that endocrine therapy could put the growth process in reverse. It might be possible to influence the extent of growth of the bone structures by endocrine therapy, but it is not conceivable that we can reduce the size of bones, particularly selecting an individual bone in the body, with orthodontic appliances with or without endocrine therapy. *If any such result has ever been achieved, it is incumbent upon anyone that has achieved it to report it.*

With regard to the statement that Class III cases have frequently been treated with good success, it would be interesting to note that the reviewer is not in agreement with the authorities in the field of orthodontics.



Fig. 10.—Extraoral anchorage as advocated by Angle.

As recently as 1932 Brodie⁷ (p. 219) made the following statement: "Anything like a comprehensive review of the literature or a survey of clinical results reveals the fact that treatment of Class III malocclusion, unless started at a very early age, meets with less success than that of the other two great classes. In fact, many operators consider failure inevitable if an attempt at correction of a Class III deformity is made on the permanent denture. These same operators will undertake, with the expectation of good results, the treatment of Class I and Class II cases for patients formerly considered beyond the orthodontic age."

He continues on page 229: "When we come to consideration of the methods of treatment that stress the occlusal relations of the teeth, we begin to find some measure of encouragement. Unquestionably the intermaxillary elastic has contributed more to this type of treatment than has any other single thing. Here we find cases treated in the permanent denture and some of these cases have held, so far as occlusal relations are concerned, but I know of no case where the facial deformity has been eradicated.

"Much has been made of the endocrine side of the field and we know that the acromegalic exhibits an overgrown mandible. But he also shows his symptoms in his hands, feet, nose, etc. In derangements of the endocrine mechanism the removal of the hyperactive glands and the feeding of extracts of under-functioning glands have both led to recovery of balance. This seems to point to the fact that these disturbances do not place an ineradicable mark on the bones and does not prove that these contributing factors serve to hold or maintain a deformity when the cause is removed. In short, merely because a bone has been altered by a constitutional disturbance is no sign that it has lost, forever, its power to react to normal forces.

"This same point of view must be considered when we think of deformities caused by inequalities in the growth rate. It is easily conceivable that a mandible might, in a sudden spurt of growth, be carried beyond limits of self-recovery. In this event the normal factors, enumerated above, would serve to maintain and increase the abnormality. These are but hints that should be considered in thinking about this subject."

Strang⁸ in his *Textbook of Orthodontia* (page 553) in discussing a case of Class III malocclusion tells us, "The ideal time to treat cases in this class is at a very early age because, at this incipient stage, the perverted axial stress, exerting its powerful influences through functional forces, has not produced appreciable overgrowth or modification of form in the body of the mandible. By the time the premolars and second permanent molars have erupted there is usually marked hypertrophy of the mandible and distinct change in its architectural form which can *never be fully overcome by treatment.*" [Italics are mine.]

Strang continues by quoting B. Holly Broadbent to show that, "The changes noted, as a result of Class III malocclusion, are an excessive forward growth of the symphysis of the mandible, a reduction in the vertical growth at the angle of the mandible and a retardation of the forward growth of the maxillae. *There is no forward displacement of the condyles.* [Italics are mine.] Any plan of treatment if based upon sound principles, must take this evidence into consideration and offer reasonable means of correcting the defects."

On page 573 Strang tells us that, "In the early stages of Class III deformities, treatment is comparatively easy and the final results are very satisfactory. This is so because at this age the orthodontist is confronted only by a *tooth malrelationship*. There has not been time or reason for bony modifications to appear."

Hellman⁹ says (p. 2162): "In the treatment of Class III malocclusion of the teeth, it is the general consensus of opinion that the lower teeth should be moved distally in order to establish normal occlusion. Of course, this is quite natural, since the lower teeth are supposed to be mesially from the normal. Some orthodontists even lay claim to the fact that they actually do move the teeth distally. The proof that this has been accomplished is lacking. The fact entirely lost sight of when such claims are made is that the patients under the care of the orthodontist are still in the developmental period of life. Their faces have as yet not reached the adult state and are still undergoing active growth."

He continues (p. 2168): "What is the effect on the face years after orthodontic treatment has been successfully completed? It is generally assumed that, after the dentition of a case of malocclusion has been restored to normal occlusion, Nature will take care of it thereafter. I know of no evidence that this is a fact. The matter seems to be taken for granted."

3. "There is no support for this latter statement [that tension will destroy bone]; as a matter of fact, tension stimulates bone growth, does not destroy it."

Murk Jansen¹⁰ tells us (p. 47) that, "In the vertebral bodies of man (and even of mammals and snakes) not only the transverse elements of cancellous tissue are failing which would coincide with the directions of tension, but also the vertical (axial) elements they would have to connect. Tension appears to lack the power of bone formation in the human vertebral bodies, in the normal ones as well as in the deformed and bent ones, the power which pressure appears to have in all cancellous tissue we examined."

"This contrast between tension and pressure in the effect on bone formation compels us to part with the prevailing conception concerning the 'trajectorial' structure of the bones, 'with Culmann-Meyer's crane hypothesis,' with Meyer's 'calcaneum hypothesis,' with Roux's notion regarding the structure of the ankylosed knee and last but not least with 'Wolff's law' of the transformation of bones. All these theories have spread like weeds over the field of our science and obstructed the way to the knowledge of the formation of bone, of the structure, the form and the deformation of bones. The merit cannot be denied to Wolff of having directed attention to transformation phenomena of bones, i.e., to changes in the cancellous tissue of bones corresponding with changes of forces acting upon them. Nevertheless bone tissue does not behave according to his law, which ascribes the power of bone formation both to tension and to pressure stresses. Of Wolff's *Gesetz der Transformation der Knochen* (Law of the Transformation of Bones) the 'law' appears to be untenable, only the 'transformation' remains, and even—as will be pointed out in the following pages—with regard to pressure stresses in a degree far more restricted than Wolff believed. And it is to be hoped that before any author in the future states that a bone deforms according to 'Wolff's law' he will take the trouble to convince himself of the fact that behind the flow of words with which Julius Wolff has published his 'law' in the above quoted work, there is no proof whatever to show that tension stresses have the power of bone formation. In so doing he would be helpful in laying a foundation to the sound development of the knowledge of deformities."

Jansen continues (p. 71), "Wherever pressure is displaced by tension, be it in the direction of the primary elements, or in that of the secondary ones, we see atrophy of the cancellous tissue."

"Nowhere in cancellous tissue did we meet with bone elements in which the action merely of tension stresses had to be assumed."

In 1928 Leriche and Policard¹¹ (p. 102) refer to the question of the effect of traction on the development of bone.

"The influence of traction on the condition of bone is still debatable. In the views of Roux and of Weldenreich, traction can bring about bone formation."

Consequently *traction bones* should exist. One may cite as examples calcified ligaments and bones of fibrous type. The example of the great trochanter is classical. The researches of Julius Wolff on this subject are familiar. The question merits reopening in the light of the ideas advanced above.

"In any case, ligamentous ossifications are generally in relationship with rarefactions of the skeleton in the vicinity. Ollier insisted on this. Holzknecht constantly found relationship between the two phenomena. Ligamentary ossifications are always secondary to skeletal destruction."

P. D. F. Murray in 1936¹² (p. 152) expresses the opinion that, "There are, however, cases in which a mechanical cause of ectopic ossification can be advanced with greater probability. Such are 'exercise' and 'riding' bones, which develop in particular muscles in association with definite kinds of physical activity, and also ossifications in the walls of arteries, since these are subjected to the intermittent pressure which, as will be shown, is probably the form of mechanical stressing which is most effective in advancing the deposition of bone. In the case of exercise bones, however, it is probable that the responsible cause is not the mechanical stressing itself but the muscle trauma which results from it, and Busse and Blecher (1904) cite three cases of myositis ossificans following a single severe trauma in which the limb was immobilised after the injury."

Murray continues (p. 112): "Jansen (1920) and Carey (1929) are in agreement with Triepel in denying the trajectorial nature of bone structure, but differ from him in refusing to admit that tension stresses play any part (save a negative one) in determining its architecture, while holding that pressure is all-important. These authors regard such a bone as the human femur as a pressure-resistant structure whose cancellous architecture is related to the pressures resulting from the weight of the body but especially to the back pressures exerted by the contraction of the muscles. Culmann and Meyer interpreted the architecture in terms of resistance to body weight only, not considering the action of muscle at all. But in fact the force exerted by muscle action may greatly exceed the dead weight of the body. Thus Christen (quoted from Jansen) states that in standing on one foot and on tip-toe, the weight of the body (60 kg.) is transmitted to the ground through the metatarsals, but the quadriceps, in order to balance this and maintain the position, must exert a force of 240 kg., and this is transmitted through the tibia. That muscular force is often greater than body weight is shown by our ability to jump, which would otherwise be impossible, and is impossible in such heavy animals as elephants. In their examination of the frontal section of the femur these authors find the 'tension' tracts of the lateral side of the upper end to be in reality 'back pressure vectors' (Carey) of the pull exerted by the glutei and by the short pelvo-femoral muscles which actively press the femoral head into the acetabulum. Triepel is at least in general agreement in considering that the adherents of the trajectorial theory have been led into error by their failure to consider the action of muscles.

"Jansen and Carey certainly show that many, if not all, tracts of cancellous bone which have in the past been regarded as tension tracts may be, and probably are, in reality subjected to pressure."

"Thus Jansen (p. 133), in a study of a number of bones whose structures have been in various ways modified, finds that increased pressure always leads

to strengthening of the bony structure while increased tension leads to atrophy. In *coxa vara*, a condition in which the head of the femur is depressed so that its angle with the shaft is decreased, the pressure stresses on the concave side are increased and the bone is there thickened, while on the convex side, where the tension is increased, it suffers atrophy. In scoliotic vertebrae he finds it a constant fact that the same occurs, the side of increased pressure being thickened, that of increased tension thinned. He shows similar conditions in a number of other bones whose stressing and structure has been altered. Finally, Jansen concludes with the statement that 'The form of the bone being given, the bone elements place or displace themselves in the direction of functional pressure' is the allowable remnant of Wolff's law."

In conclusion we can obtain considerable information with regard to the effect of tension from clinical experience, particularly in the field of orthodontics. We have the opportunity in our work to apply pressure and tension much more readily than can be done in any other part of the human economy. Tension is applied through the apical fibers of the periodontal membrane when an appliance is adjusted to guide a tooth from a position of infraclusion to the line of occlusion. It has been the experience of everyone in the field of orthodontics that when the effort is made to elevate teeth, which is an attempt to stimulate the development of bone, a slight increase in the tension so completely overcomes the trophic stimulus of pressure as applied in mastication that the tooth becomes extremely loose. This extreme looseness is due to the destructive influence of the tension force. Anyone who feels that tension is a stimulus for the development of bone can readily learn that this is not a fact, if he will attempt to elevate teeth with the same rapidity that he would attempt to move teeth through the application of pressure.

4. The following statement made by the reviewer cannot be substantiated and it is absolutely incorrect: "*The alveolar process supports the teeth and changes with them, but the body of the jaw bone supports the alveolar process and changes with the latter. All tooth movements have a far-reaching effect and skull measurements as well as radiographic studies show that the jaw bone proper and the ramus of the mandible are affected by orthodontic treatment. Class III malocclusions have frequently been treated with good success, especially if endocrine facts were properly taken into consideration.*"

It is reasonable to assume from the statement made that the growth of the jaw is to a very great extent dependent upon the growth of the alveolar structure. This is true and undisputed. The inference is made, however, that a change in the position of the alveolar structure can in some measure reduce the size of the body of the mandible. As a result of this idea, extraction has been resorted to in some instances by individuals in an effort to establish normal occlusion in the treatment of Class III. In all these cases it has been found that the mandibular teeth can be tipped lingually to a very great extent without in any manner reducing the size of the mandible.

"Extraction of the mandibular bicuspid has been repeatedly resorted to without success." Brodie⁷ (p. 228).

Hrdlička¹³ points out that there is growth not only up to the adult period but throughout the third or fourth and in some instances the fifth decade.

Following the same trend of thought, Goldstein¹⁴ (p. 86) points out, "The effects of old age are: all dimensions of the head except minimum frontal diminish somewhat: all face lengths, except nose, decrease appreciably, primarily as a result of loss of teeth; all face widths are slightly greater; depths of face diminish somewhat, *except auriculo-nasion and auriculo-menton.*" [Italics are mine.]

It will be noticed that the diminutions that take place are only as a result of the loss of alveolar structure in the edentulous cases to which he refers. Here we find that with the loss of the alveolar structure the body of the mandible does not decrease in size. This is another indication of the fact that once a bone has reached its maximum growth it is not reduced in size except by surgery.

One may suspect that the reviewer was obliged to read the chapter hastily. It may be hoped that, with more leisure, he would have avoided the rather serious implications that I ignored or was unaware of facts which I had indeed fully examined and taken into consideration.

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REPORT ON TWO CASES OF CLEIDOCRANIAL DYSOSTOSIS

HERBERT R. COOPER, D.D.S., F.A.C.D., LANCASTER, PA.

CLEIDOCRANIAL dysostosis is a very peculiar clinical entity, congenital in origin, which should be of great interest to the orthodontist as well as the physician. This condition received general attention in 1898 when it was described and named by Marie and Sainton.

It is generally believed that a congenitally defective clavicle is the one particular thing observed in all cases. This defect may vary from the presence in the shaft of a thin fibrous section which can be diagnosed satisfactorily only from the roentgenograms. It can resemble an ununited fracture or it can be the complete absence of both clavicles. There are many anomalies in these cases which I shall not discuss in this presentation.

I wish to report these cases of cleido cranial dysostosis because of the rarity of the condition. In reporting them I shall attempt to describe the condition generally as recognized by many writers, and since these two cases fit the description so perfectly it will be unnecessary to describe them other than the general discussion of the entire condition.

The one case is a girl, aged fifteen years, which we reported in 1931.* The other one is a boy, aged eleven years, which I recently discovered. Both children are healthy and in their proper grades at school. They both indulge freely in whatever athletic activities they prefer without any ill effects. In both cases no members of the family are known to have defective clavicles or abnormal dentition. In both cases the anterior and posterior fontanelles are about a half inch in diameter. These do not close. The only complaint the patients offer regarding this condition is the fact that exposure to the heat of the sun in the summer time affects them slightly if a suitable head covering is not worn.

Cleido cranial dysostosis manifests itself from a dental standpoint in the delayed eruption of the teeth. It usually, however, seems to affect only those teeth that have deciduous predecessors.

For years there has been much speculation and many theories as to the process of the eruption of teeth, and dental literature has devoted much space to this subject; yet the mechanism by which teeth find their way into proper position and stop there is far from being understood.

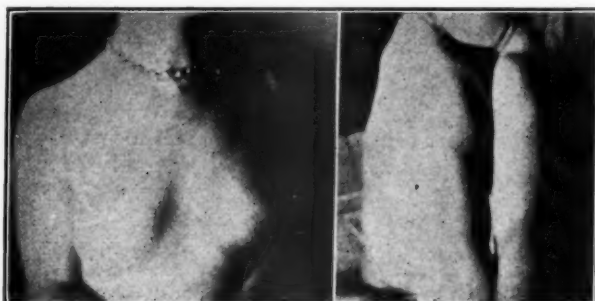
Some teeth are delayed in their eruption because of mechanical causes; in other words, they are late coming in because they have met with an obstruction in finding their way into the arch. For example, the cuspids have to travel some distance from where they begin to develop, and they must pass between the lateral incisors and the first bicuspids. Frequently there is not sufficient room for them to do this, and they either remain in the jaws or erupt on the

Read before the New York Society of Orthodontists, New York, N. Y., March 7, 1938.

*American Journal of Roentgenology and Radium Therapy 26: November, 1931.

buccal or palatal side of the arch. We are not certain of the cause for the delayed eruption of the teeth in cleidocranial dysostosis. We know that in this condition the bones laid down in membrane, wholly or partially, are the ones particularly affected. We also know that, after the clavicle, calcification occurs next in the mandible and then in the maxilla. Whether this fact has anything to do with the delayed eruption of the teeth or the noneruption of the teeth is problematical.

It has been suggested by some that the entire syndrome is due to the absence of certain chemical constituents for correct ossification, and it may be



A.

B.

Fig. 1.—A, Normal posture; B, shoulders approximated anteriorly. (Enlargement from 16 mm. motion picture film.)

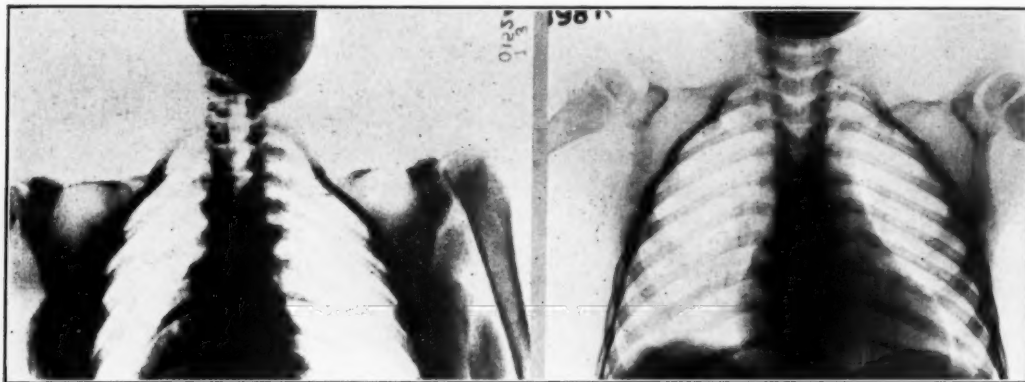


Fig. 2.

Fig. 3.

Figs. 2 and 3.—Note absence of clavicles.

looked upon as a deficiency disease, possibly due to interference with calcium metabolism.

The following has been contributed by Dr. Paul O. Snoke, Roentgenologist, and Dr. R. N. Klemmer, Chief of Staff of the Lancaster General Hospital, with whom I have studied these cases.

From an embryological point of view Piersol states that the clavicular center in the embryo is laid down before all others, being evident at the sixth week. The cartilaginous outline appears later, and ossification begins shortly thereafter. The center of the shaft ossifies first. If therefore we wish to find the etiologic factor in these cases we must go back to the sixth embryological week.

We secured several embryos from the collection in the museum of the Lancaster General Hospital and submitted them to roentgen examination. The first one was sixteen weeks old and here we found the clavicles ossified and well developed. The second embryo was less than eight weeks old. We saw no evidence of calcification anywhere. The shoulder girdle was visible but only cartilaginous.

Associated defects reported in the literature are so numerous that only a brief synopsis can be given. The facial skeleton is frequently smaller than the

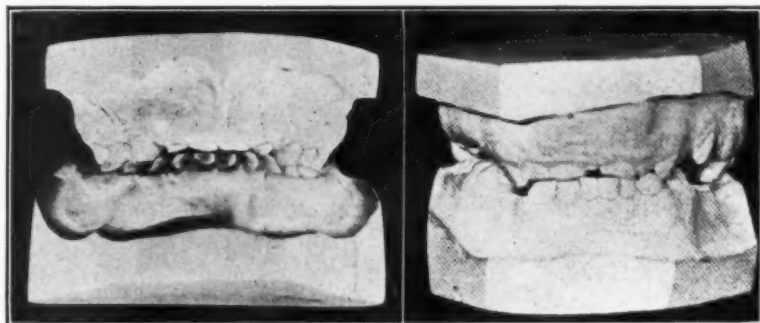


Fig. 4.

Fig. 5.

Figs. 4 and 5.—Dental casts of teeth of both cases.

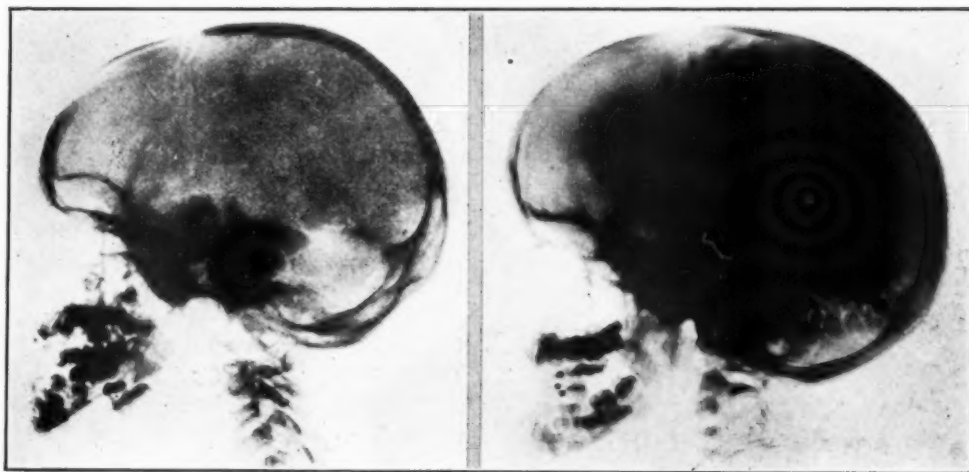


Fig. 6.

Fig. 7.

Figs. 6 and 7.—Note open bregma and anterior sagittal sutures.

cranial. The frontal, parietal and occipital bosses are often unduly prominent. The mandible is commonly prognathous. The face is often small, both absolutely and relatively, in comparison with the head. The suborbital region may be shrunk and depressed. There may be a marked constriction of the maxillary region of the upper face. The bridge of the nose may be sunken as a result of defective formation or even absence of the nasal and lacrimal bones. The zygomatic bones may be very small or otherwise defective, and the superior maxillae are often small. The sinuses may be small or certain ones may be absent. A high arched palate is very frequent, and cleft palate sometimes

occurs. Cases have been reported with general contraction of the base of the skull and a saddle-shaped formation of the transverse diameter or the tilting forward of the foramen magnum so that it pointed toward the frontal bones.

Anomalies of structures other than the bony skeleton seem rare. Of course anomalous muscle and tendon attachments accompany the bone defects. Slight and moderate disorders of thyroid function, particularly hypothyroidism, seem rather frequent.

This condition is frequently but not necessarily hereditary. It may be transmitted by either parent to either sons or daughters. It was formerly believed to be limited to two generations, but there are reliable reports of the anomaly passing through three or even four generations.

We believe that the hereditary element cannot be ruled out except by roentgenograms of the shoulder girdles of all the members of the immediate family. These defects may be so slight that they will escape detection during a physical examination, or the examiner may erroneously consider the deformity consequent upon fracture.

The etiology is speculative. Jansen suggested that a small amniotic membrane with hypertension of the amniotic fluid pressing on the embryo at about the eighth week of pregnancy caused the condition. This explanation seems untenable. Hultkrantz, Paltauf, and others believe that the fault lies in a primary change in the parental germ plasma. The syndrome strikingly concerns the bones developed from membrane such as the clavicles and the bones of the cranium, and yet defects of other bones are frequently associated. The shaft of the clavicle is developed from membrane while the distal extremities arise from cartilage. We find that although the clavicular defect is usually central, the whole clavicle may be absent. The wide sutures and the open fontanelles are not due to an abnormally large brain but to retarded growth of the bones of the cranium. Cleidocranial dysostosis is closely related to, and must be distinguished from, achondroplasia and rickets. The distinction is easy because neither of the latter diseases has defects of the clavicles. Many of the secondary features of cleidocranial dysostosis, however, are so similar to rickets that certain investigators have considered that the latter condition almost constantly accompanies defective clavicles and therefore accounts for many of the findings in this clinical entity. Kelley suggests that cleidocranial dysostosis is an abnormal condition inherited as a dominant Mendelian factor, and is a mutation of recent origin. This seems to be a logical conclusion.

The therapy indicated in these cases is problematical. Vitamins and mineral salts were administered with the hope that they might have some effect in helping nature close the fontanelles and stimulate the eruption of the permanent teeth in both cases. No improvement was noticed. Many writers suggest that orthodontic treatment is indicated to help the dental defects. However, what one can do from an orthodontic standpoint to help so many teeth to erupt is still not determined. I believe that if we could determine the reason for the permanent teeth not erupting, much light would be shed on why teeth erupt normally.

NEUTROCLUSION WITH INFRAVERSION OF THE MANDIBULAR MOLARS AND SUPRAVERSION OF THE MANDIBULAR ANTERIOR TEETH

HARLE L. PARKS, D.D.S., ATLANTA, GA.

HISTORY.—The patient appeared for treatment on August 28, 1931, with the following history: Patient, male, aged 12½ years, began walking and talking at about one year of age, deciduous teeth appeared at about six months, permanent teeth appeared at age 6 years. General health had been poor until 1931; the patient had a general undernourished appearance but was not susceptible to colds and sore throat; tonsils and adenoids had been removed in 1927. There had been no other operations on nose or throat; patient breathed through the mouth, and had a narrow nasal passage. Patient had had whooping cough and chickenpox. In August, 1927, patient broke the right maxillary central incisor; in July, 1931, he broke the left maxillary central incisor. Both teeth remained vital. Posture fair; slightly anemic appearance; vision, speech and hearing good; above normal in height; weighed seventy-five pounds. Patient got plenty of exercise. His diet was very deficient in leafy vegetables. Prenatal condition good. Both father's and mother's teeth were irregular.

Attributed Etiology.—I have been unable to establish any definite etiologic factors that have had direct bearing upon malocclusion in this case.

Diagnosis.—This case was diagnosed as being a neutroclusion case with infraversion of the mandibular molars and supraversion of the mandibular anterior teeth with restriction of both arches.

Appliance Construction.—This case was treated with the following type appliances: On the maxillary arch, the first molars were banded and R. 0.025 tubes were used on the bands. A labial bar was constructed of 0.040 wire with 0.022 wire attached in front of the tubes to form loops.

On the mandibular arch, the first molars were banded, using half round perpendicular tubes for a lingual appliance. Half round posts were placed on 0.040 wire, and the appliance was constructed to rest well up on the lingual surface of the anterior teeth. Recurved finger springs of 0.020 wire were attached on the appliance extending to the median line. Lock wires of 0.025 were attached in the posterior region to hold the appliance in position.

Treatment.—The maxillary appliance was ligated to the bicuspid for expansion and to the incisors for rotation and expansion. On the right side the loop wire was opened to give a forward movement of the incisors, creating a sufficient amount of space for the cuspid to erupt.

On the mandibular appliance the recurved finger springs were adjusted for expanding and carrying forward the anterior teeth. As the anterior teeth

Fig. 1.

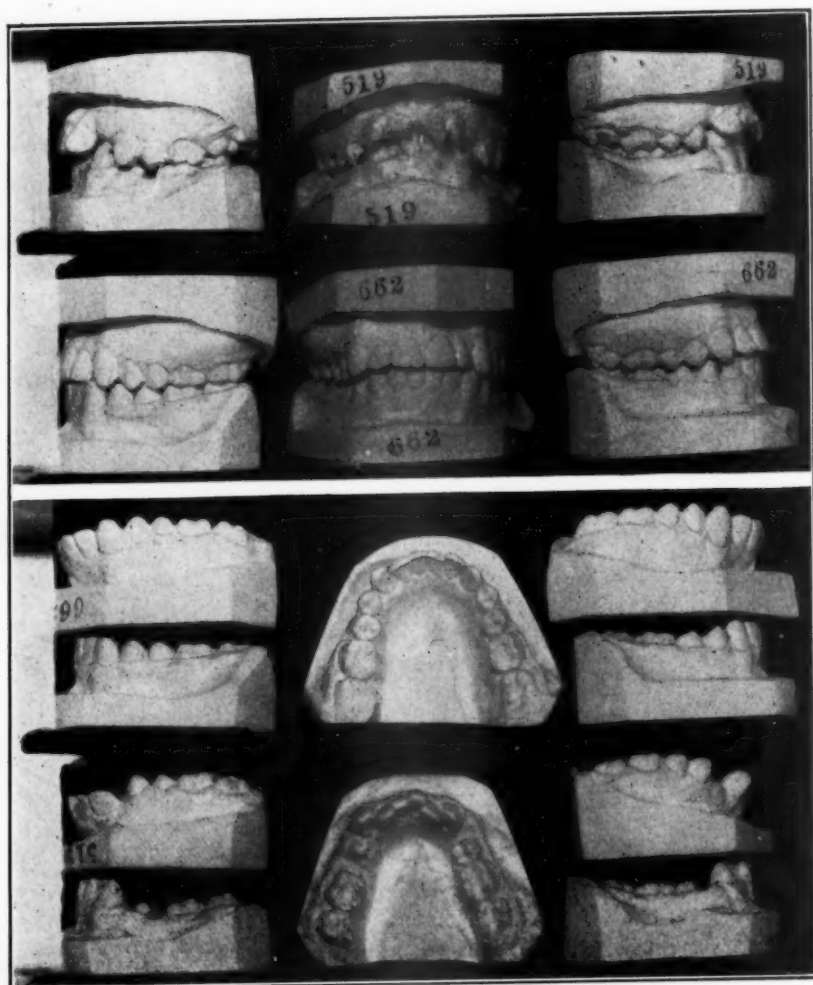


Fig. 2.

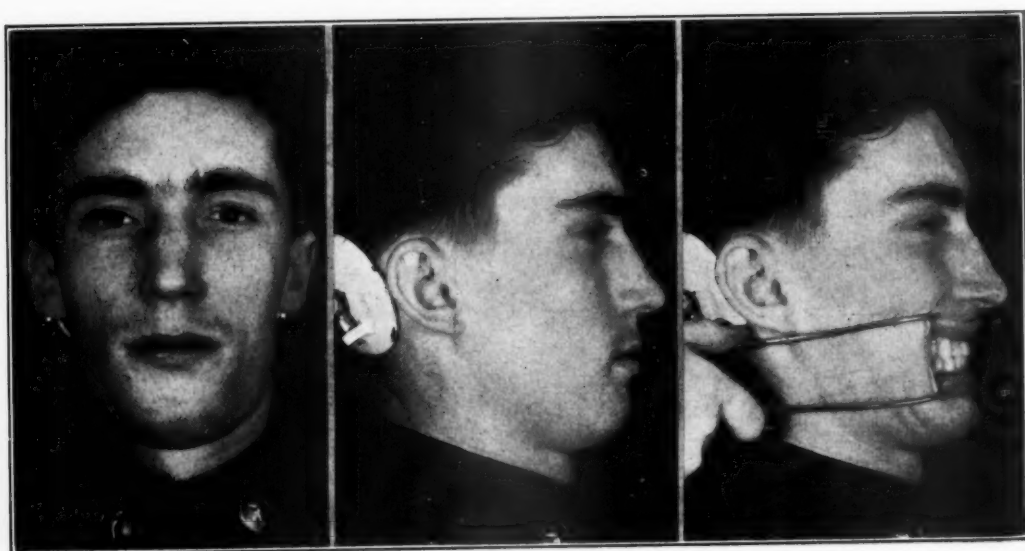


Fig. 3.

moved forward, the appliance was adjusted with a downward bend in the first bicuspid regions. This aided in carrying forward and depressing the anterior teeth. Also it assisted the molars in erupting into proper alignment.

Fig. 1 shows front and lateral views of the case when started, and front and lateral views of case when completed, with porcelain jacket crowns on the maxillary central incisors.

Fig. 2 shows occlusal views of mandibular arch before and after treatment, and lateral views giving a relative comparison of the correction of the infraversion of the molars and supraversion of the anterior teeth.

Fig. 3 shows photographs of patient after treatment was completed.

Results Achieved.—I feel that fair results were obtained from treatment, without having to use a bite plane for depressing the mandibular anterior teeth.

Prognosis.—I am confident that the infraversion of the molars and the supraversion of the anterior teeth will remain in normal relation.

Observation.—The case has been observed for four years, and there has been no relative change of the infraversion of the molars or supraversion of the anterior teeth. A slightly lapped condition occurred with the mandibular incisors at the time of the eruption of the mandibular third molars. The molars have been removed, and the slightly lapped condition has been corrected.

CASE REPORTS

JOHN H. WORTHEN, D.D.S., CONCORD, NEW HAMPSHIRE

CASE 1.—Impacted maxillary central incisor with retained deciduous central incisor and a supernumerary tooth present.

Family History.—Father's height was 5 ft. 3 in., weight 122 pounds. Mother's height was 5 ft. 2 in., weight 94 pounds. The father lost his maxillary teeth at 17 years of age. The mother has retained hers and they are regular.

Personal History.—Female, aged 11 years when treatment was started; weight, 67 pounds; height, 4 feet 7 inches; health excellent; no adenoids; tonsils normal. Child had had the usual children's diseases.

Etiology.—There have been no abnormal tongue, lip or mouth habits, and she has been a normal active child. The cause of the abnormality is obscure.

Classification.—Class I (Angle). Molar region is about 3 mm. too narrow; bicuspid region about 9 mm. too narrow; cuspid region about 7 mm. too narrow. There was a larger percentage of lack of development on the right side. The right maxillary central incisor was 3.5 mm. to left of normal. The left maxillary central incisor was impacted in a horizontal position above the left lateral incisor and cuspid. The deciduous left central incisor was in position (Fig. 1) and a supernumerary tooth was above the deciduous tooth. Size of permanent lateral incisors was 8.6 mm. mesially-distally (I have not heard of any wider laterals); the right central incisor was 10.6 mm., and the left central incisor was 10.85 mm.

Prognosis.—Prognosis seemed favorable, under Dr. Delabarre's kind direction.

Treatment.—June 1, 1934, the case was started with lingual arches and Angle-Young half round locks attached to first molar bands. Finger springs were added for various movements of individual teeth. Oct. 15, 1934, the mandibular arch was completed except for turning the cuspid.

On Sept. 6, 1935, I shaped a chrome labial wire for the maxillary arch with inverted U-loops mesial to the molar tubes and a wide inverted square ended U from mesial of the right maxillary central incisor to the mesial of the left maxillary lateral incisor, also double curved finger springs to bear on the mesial surfaces of the right maxillary central incisor and the left maxillary lateral incisor. Channel bracket bands were placed on the right central and lateral incisors and on both cuspids. Curves in the arch wire were slightly straightened to increase the size of the arch.

Ample space for the left central incisor having been secured, the case was allowed to rest from May 2, 1936, to learn if the left central incisor would come down by itself. No progress being observed by the end of that year I made a platinum ring bolt with two 1 mm. links of platinum ligature wire. The pa-

Presented before the New York Society of Orthodontists, New York, N. Y., March 8, 1938.

tient's dentist, Dr. Harlan Besse, one of our New Hampshire Board of Examiners, opened the tissues over the central incisor, drilled into the nearest corner and cemented the ring bolt. A chrome finger with hook on the end was formed to hook into the end link. As the tooth progressed, links were cut away then the finger hooked into the ring of the bolt in June, 1937. The tooth came down edgewise, mesial corner labially. In July a band with 0.022 tube was placed on the tooth which was gradually turned and brought into an upright position by finger springs.

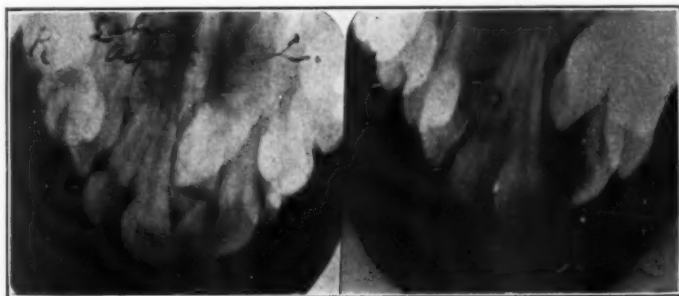


Fig. 1.



Fig. 2.

Figs. 1 and 2.—Case 1.

The movement of the tooth in the latter part of February and in March was so rapid I feared for the blood vessels and nerves supplying it, so I eased up on the finger springs. From then on, little pressure has been needed. (Fig. 2.)

Retention.—At present a 0.022 chrome labial arch and wire ligatures are being used. Later I am thinking of using a Holly retainer.

Result.—I expect a very satisfactory result. Even the retention of all these wide teeth has caused no inharmonious results in facial development.

Period of treatment (excluding six months waiting to see whether nature would bring the central incisor down) was three years.

CASE 2.—Open-Bite: Infraversion extending distally to and including second bicuspids above and below.

Family History.—Parents were normal so far as could be learned, of Swedish nationality.

Personal History.—Female, aged 14 years; healthy and active; no adenoids; tonsils normal.

Etiology.—Etiology is obscure, cannot learn of any bad mouth habits.



Fig. 3.

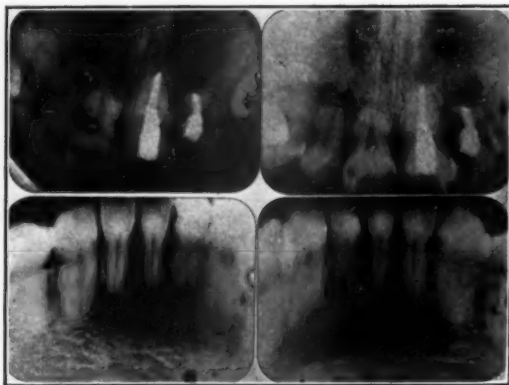


Fig. 4.

Figs. 3 and 4.—Case 2.

Classification.—Class I (Angle) with open-bite.

Prognosis.—Doubtful but improvement probable.

Treatment.—Started January, 1930. Expansion in effort to close the bite.

Appliances.—I used lingual braces with half round wire and tube locks on the first molar bands. In October I put tie bracket bands on the anteriors above and below. I brought a spur of 0.026 wire from the lingual arch, labially just distal to the cuspids. To this spur I soldered a labial section of 0.022 and carried finger springs distally to bring occlusion traction on the first bicuspids.

In April intermaxillary elastics were placed from the maxillary cuspid area to the mandibular cuspid area. In November, 1931, a 0.022 round labial arch replaced the maxillary lingual arch. The following April, a 0.022 round labial arch took the place of the mandibular lingual arch. In July, 1932, intermaxillary elastics were left off permanently because x-ray examination indicated that resorption of the root ends was in progress, particularly the incisors.

No further effort was made to close the bite. From there our attention was given to correcting the arch form exclusively. In May, 1933, the maxillary teeth were retained by a simple lingual arch from first molar to first molar with half round locks. In August, 1933, the mandibular teeth were retained with a short lingual arch soldered to the lingual of bands on the cuspids. In July, 1935, the retainers were removed and control models made. X-ray pictures made at this time had a radiolucent area at the apex of the left maxillary lateral incisor. The patient did not recall any falls or injury in that region and felt no discomfort.

On March 5, 1936, the patient presented with a large swelling palatally and labially over the root of the left maxillary central incisor. She had had German measles, and her dentist had sent her gum plasters and directed the use of an ice pack. Root canal was treated and filled by her dentist, Dr. Harlan Besse, and there has been no further trouble. X-ray pictures indicate as near normality as we would expect in such a case.

Results.—Models made from impressions taken last month show slight retrograde movement.

Question.—Had the four bicuspids been removed and the treatment been of shorter duration, would better results have been obtained with less trouble and expense and less likelihood of resorption?

NEW BAND FORMING PLIERS

SPENCER R. ATKINSON, D.D.S., M.D.Sc., PASADENA, CALIF.

THE McClinton band forming pliers makes it possible for orthodontists to make bands from material of various thicknesses and degrees of hardness. These pliers are simple, strong, and most efficient. It is much more difficult to make a poor band with the McClinton pliers than it is to make one of perfect fit.

Use some good technique to obtain an artificial stone die of the tooth to be banded. Select a piece of band material, about two inches long; spot weld or solder the ends together. Place this band material around the stone die.

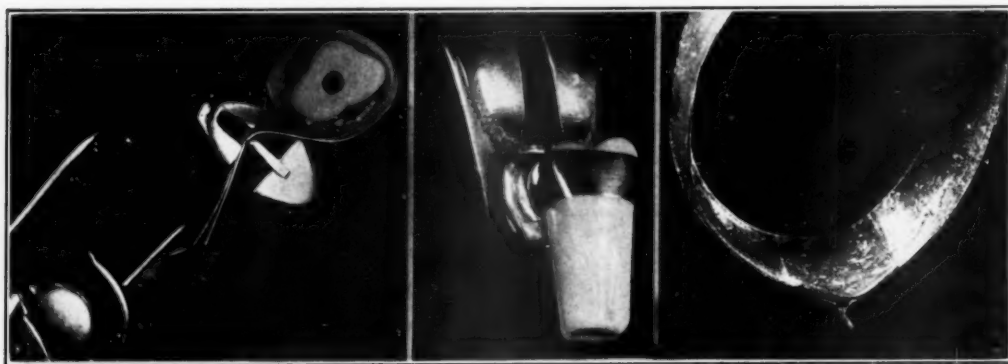


Fig. 1.

Fig. 2.

Fig. 3.

Grasp the band material as snugly as possible with the McClinton band forming pliers, squeeze the handles, and watch the band material stretch and flow around the tooth.

As soon as the tongue of one of the beaks engages the band material over the groove of the opposite beak (Fig. 1) slipping of the band material ceases; from then on the metal is stretched like rubber around the tooth (Fig. 2).

The band is now removed from the die; and, if of precious metal, it is soldered, the end cut off and polished. If of stainless steel, the ends are spot welded near the band, the excess being removed. A piece of this same band material $\frac{1}{8}$ inch long is now placed inside the band over the seam and thoroughly welded into place (Fig. 3). The outside projection of the seam may be removed and the band polished.

The orthodontic profession is indebted to Dr. Ray McClinton of Burlingame, California, for this very efficient pair of pliers.

REPORT OF THE COMMITTEE ON SOCIO-ECONOMICS AND THE COMMITTEE ON LEGISLATION

AMERICAN ASSOCIATION OF ORTHODONTISTS

Socio-economics has gone hay-wire. Socio-economics is the distribution of wealth to meet human needs. According to statistics, 13,000,000 are unemployed, 5,000,000 are on part-time employment, and general business activity has receded to the level of the last quarter of 1933. The depression bottom was reached during the bank holidays in March of the same year. There has been a general improvement recently though, and it is the opinion of many economists that the long recession has been definitely broken and that we are certain to see the business cycle take another upward turn. How long it will last is beyond us to predict.

Economically, orthodontic practices share in adversity and prosperity in relation to business activity. Orthodontics, likewise, will assume the same relative level socially and economically that is established for medicine.

There was little use or application of the word "socio-economics" until the New Deal made socialization of industry one of its principal objectives. "To socialize" means to subject an industry or enterprise to the principles of ownership, operation, and distribution laid down by socialism. In recent years we have witnessed a rapid expansion of federal control through direct and indirect methods of regulation, financial aid, and general management.

Never before in a similar period of time has there been so much political energy and money expended in an effort to harmonize the so-called social, economic, and political sciences. For the most part, these subjects are distinctive in character and become incompatible when politics attempts to solve all our social and economic ills in a few sessions of Congress. Even if all these reform measures were good, business could not digest them fast enough to prevent serious economic strife.

The professions of medicine, dentistry, nursing, and pharmacy have been justifiably alarmed about socialized medicine for nearly five years. In the beginning, thousands upon thousands of the optimists in these professions thought it could not happen here. They are now wondering where it will end. Even though the people have never voted for such a change on a clear-cut issue, the transition is taking place. Whether we like it or not, we have the beginnings of state medicine in this country on a broad scale, and the taxpayer's money is paying for it.

The original program called for universal health insurance as a part of Social Security, but its vast scope and gigantic cost, coupled with the determined opposition from the medical and dental professions and the lay public, made it necessary to attempt this reform by indirection. A large number of the emergency bills, enacted with the cloaked vestments of employee and public welfare, are now being used to provide medical and dental care on a broad scale in devious ways. That which could not be accomplished by direct methods is now being performed by indirection.

Under the caption of "Socialized Medicine Is a Reality" in *Nation's Business*, Fred De Armond states that the Federal Home Loan Bank Board has formed a Group Health Association to provide all necessary medical care for the group. The F. H. L. B., through its director, pledged \$20,000 of public funds for 1937 as a share in the support of the movement, with the balance to be paid monthly by the members. A like amount was pledged for 1938.

Presented at the Thirty-Sixth Annual Meeting, Hollywood, Calif., July 11-14, 1938.

A protest and investigation disclosed that, instead of \$20,000, the amount so spent by December, 1937, was \$37,000—nearly as much as the Home Loan Bank Board had promised for two years. R. N. Elliott, acting Comptroller General, studied the matter closely and gave an official opinion: The diversion of this money, he said, was "without authority of law." All this took place while Congress was debating the abolition of the Comptroller General's office.

Later, this Group Hospital Association came in conflict with the District of Columbia hospitals and the District of Columbia Medical Society, because they disputed the legality of the organization. According to an Associated Press news item in the Washington Star, the Department of Justice is investigating complaints that the American Medical Association and the District of Columbia Medical Society have violated antitrust laws by opposing public health programs. "Large issues are said to be involved in the case," the Star said, "one of the more important being whether the practice of medicine is commerce or trade within the meaning of the antitrust laws."

The District Society adopted a by-law prohibiting its members from engaging in such practice. In this connection there was a Senate Bill, No. 3847, introduced by Mr. King on April 14, which was read twice and referred to the Judiciary Committee. This bill provides for the incorporation of certain political persons as Group Hospitalization, Incorporated. It also authorizes and empowers this body to enter into contracts with individuals or groups of individuals to provide for hospitalization of such individuals or groups of individuals upon payment of rates or premiums as may be specified. The corporation is further empowered to enter into contracts with hospitals for the care and treatment of such individuals in accordance with the terms of their individual contracts, and to cooperate, consolidate, or contract with groups or organizations interested in promoting and safeguarding the public health. The corporation is declared to be a charitable and benevolent institution.

The bill is so brief and cleverly drafted that it appears comparatively innocent of any wrongdoing. In effect, it would be fully capable of providing a voluntary health insurance system for the country. This corporate system of health insurance would potentially enlist the services of about three-fourths of the physicians, pharmacists, and nurses of the country. With it disguised as a nonprofit, charitable organization, it is only reasonable to assume that such a spirit would prevail in the establishment of salaries and fees for nurses and physicians.

Another, more drastic bill, known as H. R. 9847, introduced on March 14, 1938, by Mr. Treadway, was referred to the Committee on Interstate and Foreign Commerce, and was ordered to be printed. It provides for the establishment of a national system of both compulsory and voluntary health insurance. All employees coming under the act would be required to contribute 2 per cent of their wages, and the employers 1 per cent, with a maximum limitation of \$36.00 a year for each employee and \$18.00 a year for each employer. It also states that the Commission shall have the same powers as the United States Federal Courts for compelling the attendance of witnesses and for compelling the production and inspection of books, papers, and documents in connection with any inquiry, hearing, or proceeding of the Commission formed under this act. The President of the United States is extended almost complete dictatorial powers for execution of this Act. The bill is forty pages long, and to read and study its contents would lead one to believe that it was sponsored by a group using the fascist system of government as a pattern.

Other events indicate that the administration and certain members of Congress are looking with favor toward a program leading to socialization of medicine. One of the most significant acts in its implications was the report of the President's technical committee on medical care, headed by Josephine Roche, former assistant secretary of the Treasury. This committee recommended a national health program with large financial support. While it did not mention a regimented profession under a federal insurance system, it was obvious that this might be expected.

The plans propose a ten year expansion program which, if not now, would ultimately lead to regimentation of the health professions. This in turn would lead to other serious economic dislocations in the educational and industrial fields of medicine. All kinds of propaganda carrying fantastic claims and statistical information of a questionable character are being released in support of another great and costly political experiment.

Of such reasoning in these days, there seems no end. Why should building-trade labor unions be encouraged to demand higher wages and shorter hours with home building costs at an all-time high; and farmers be required to stop growing cotton and kill their hogs for government checks, when the president claims that one-third of the people are ill-fed, ill-housed, and ill-clothed—yet about one-half of this one-third own and operate automobiles? Also, children in these families find more money to spend on soda pop and candy bars each year than would be needed to keep their mouths free from disease.

A speech delivered by Senator Lewis of Illinois before the 1937 convention of the American Medical Association conveyed the impression that he was an emissary of the President and was there for a serious purpose. Among other things, he had the following to say: "The question for you doctors is not whether you like the proposed new status for the profession or whether you don't."

On July 28, 1937, Mr. Lewis introduced a joint resolution to provide medical care for the needy and those stricken with illness who are unable, because of poverty, to obtain treatment and hospitalization, and also to establish all licensed medical practitioners as civil service officers of the Federal Government. It was read twice and referred to the Committee on Finance. The resolution would authorize the Social Security Board to pay physicians under such rules and regulations as it might make. It would make it a misdemeanor under the law for any physician to deny a claimant his services.

In another direction, through its relief agencies, the Government has taken the country a long way along the road toward state medicine as practiced in European countries. Medical and dental services administered through the F.E.R.A. and the W.P.A. in New York State alone last year cost millions of dollars.

To assemble facts to justify going this route, the U. S. Public Health Service in 1935 conducted a National Health Survey. The W.P.A. cooperated, to the extent of over \$4,000,000, on a house-to-house canvass in 19 states. During the same year, the U. S. Public Health Service and the American Dental Association, with the gratuitous assistance of its members, made a cross-sectional dental health survey of the country's school children in 26 states. This year the U. S. Public Health Service, with the American Dental Society cooperating, is making a survey of the financial status of those connected with the dental profession.

A calm analysis of these reports fails to confirm the supposedly urgent need to regiment these professions. Reliable statistics indicate that the longevity of life has been extended about 11 per cent during the last fifty years, and the general health of the people has shown substantial improvement during the last decade, despite the depression. Progress should be measured not by how far it is to Utopia, but by advancement that has been made over the past.

Chairman Arthur J. Altmeyer of the Social Security Board, in addressing the American Federation of Labor convention, stated that serious consideration should be given to the problem of broadening the field of social security insurance. Again, the American Federation of Labor went on record as favoring a national program of health insurance.

Social Security is already becoming an almost unsurmountable burden. Another tax rate for a federal health insurance system would be another severe blow to millions already staggering under the greatest burden of taxation that the country has ever experienced. About 25 per cent of the average producer's income is now being absorbed in visible and hidden taxation which goes into a fund to pay government expenses. Tax money comes from the people, but it does not belong to the per capita wealth of the people. About one-fourth of the country's monetary wealth is being used by the government. Dr. Morris Fishbein, writing editorially, states that the additional taxation required to finance any of these general health-insurance programs with federal and state funds would lead to economic dislocations which would aggravate the very conditions it should remedy.

Extension of government social service programs is threatening to fix a service tax upon the public and profession equal to the existing sales tax in other realms of business. Three states have expanded the sales tax to include professional services. Colorado has perhaps attracted more attention in this direction. There the dentists attempt to collect a 2 per cent tax, paying 15 per cent of it for a sales tax to cover materials, and 85 per cent of it to cover professional services. In substance, it would amount to a 2 per cent gross income tax for orthodontists, as it would be practically impossible to add it to contract fees.

It being generally conceded that too much misdirected taxation and reform legislation in too short a time are responsible for the present-day unhealthy business situation, it, therefore, behooves all of us to take a more active and intelligent interest in local, state, and national politics, and to be in a position to throw the full strength of the profession behind such candidates and legislation as meet our approval.

Last November, a committee composed of some of the leading physicians of this country went on record as favoring a system of state medicine. These doctors, for the most part, were already devoting nearly all of their time to hospitals and educational institutions apparently interested in government subsidies. Physicians, like business men and farmers, are divided on the issue of paternalism. Those who believe in opportunity through a merit system and liberty of action oppose socialized medicine, while a fairly large group desire it.

Dr. Warren F. Draper, an assistant surgeon general, addressed the American Medical Association in an executive session at the San Francisco meeting. He, speaking for Miss Josephine Roche, head of the government's interdepartmental committee, favored coordination of health and welfare activities. He stated: "The public would take the problem of supplying medical care to the indigent in their own hands unless the doctors helped solve the problem." The delegates replied that the situation might be due more to want than to medical care. They also did not look favorably toward being politically absorbed, as they would be if government agencies took over the direction of medical care.

In face of the signs of division and weakening by some taking a defeatist attitude due to the influence of propagandists, the American Medical Association is holding steadfast to a "no surrender" position toward the regimenters. The issue raised concerns dentists, nurses, pharmacists, and even veterinarians, and is repugnant to every theory of democratic government.

In our judgment, there was little sentiment in Congress for socializing the medical and dental professions. This accounts for the bills being shelved. It is generally conceded, however, that other similar bills will be introduced at the next session of Congress. Should the President insist upon such a program, it would become very dangerous. It is significant in this connection, that Mrs. Eleanor Roosevelt, in an address in June before the National Youth Organization, urged them to study the subject of socialized medicine.

The quality of medical care would be damaged by these socialistic schemes. Vital statistics of countries having socialized medicine show much higher death and sickness rates than those of the United States. Then why are such schemes promoted? Because politicians are interested in creating more jobs and building political machines to perpetuate certain groups and parties in office. Socialized medicine, as a job-creating machine, can scarcely be equalled.

There has never been a time in the history of dentistry when there has been a greater need for action to protect our ideals. We can no longer afford to follow that lofty belief that high proficiency in professional technique alone will mean security. The day of its truth is past, unless it is protected by sound socio-economic policies. We should realize more fully that we are business men as well as professional men. The health professions should give more attention to political economics and political technique if the United States is to hold its present rating as the leading nation of the world in both medicine and dentistry. Otherwise it will sink to the same level found in the European countries.

Forty-two states will hold legislative sessions next year, says Dr. A. B. Patterson, chairman of the committee on legislation for the American Dental Association. He predicts that there will be a flood of bills introduced with more or less, and generally less, understanding of the conditions they seek to remedy by law. Some will be proposed by dentists and, in the main, they will seek to benefit the public and the profession alike. Many others, drafted by politicians, will appear, and these, as has always been the case, will seek to benefit the public at the expense of the profession. So far as is known, no legislation that has been beneficial to dentistry has ever been proposed in Congress or state legislatures that has originated outside the profession.

The strained economic situation of the country, coupled with the desire and willingness of the people to spend all they make for nearly everything besides health service, has created

a serious situation for the health professions. Long-payment plans and highly organized sales promotion schemes have taken a first mortgage upon thousands in all income brackets. They fail to budget themselves for health service, and get the foolish idea that the Federal Health Insurance is the way out. This mistaken idea is largely due to the teaching of political demagogues that the people should lean more and more on the government for security. The more noble virtues of the people to work and save for financial emergencies are being destroyed.

We are now facing another election year, and the future social and economic welfare of the people is right now being molded in the political campaigns and the ballot boxes. The majority of those comprising the health professions vote blindly on these problems because they do not know how the candidates stand on these important issues: Our local, state, and national organizations should step out and force these candidates to express themselves, so the members may take such action as they deem wise to protect themselves and the public welfare.

This can best be done in the primary elections, where the balance of power by well-organized minority groups is frequently capable of determining the outcome of elections. While a large number of candidates is usually found, the number of voters is rarely over one-third, and generally is much less. The primary elections make it easy for the political machines to nominate their man. Too, it frequently offers the properly organized minority groups a real chance for success against the demagogues and corrupt machines.

The potential influence of such action was recently demonstrated in a primary election for a district congressman. A large group of candidates, as usual, were in the field. As the campaign progressed with three leading candidates, the issue of state medicine was ignored by all. A political scoop was planned by several politically minded members of the profession for their favorite candidate. Their choice candidate was positively opposed to the Government making a public utility of the health professions. A memorandum covering the main points of the negative side of the question was furnished the candidate. Mailing lists of physicians, dentists, nurses, and pharmacists residing in the several counties of the district were assembled. Postal cards were mimeographed and addressed for mailing on Friday before the election on the following Tuesday. It was announced that he was against Federal Health Insurance, and all the legislation predicated on the same theory. There were nearly fifteen hundred members of the professions in the district.

Those receiving cards were invited to listen to the candidate's radio address on the intervening Sunday, at which time he was to discuss the subject. It was estimated, with other things being equal, that it would be the decisive factor in gathering up a potential vote of nearly 4,000, granting the assistants, technicians, wives, and other relatives and friends would be influenced. He won by about 3,500 votes. We do not mean that this piece of political strategy was responsible for his election, but we do wish to impress you with the possibilities of utilizing the potential political influence of the profession for constructive purposes.

Many writers on this subject are indicating that regimentation of the health professions is inevitable, but we do not agree with them. Some changes will come about through a natural evolutionary process, but we believe that a general revolt against this political philosophy will supersede the regimentation of these professions if they will hold a "no surrender" attitude and not let the propagandists sweep them under.

We are of the opinion that accident and health insurance for the people is sound in principle, but it should be left to the physicians, industry, and reputable insurance companies to solve, without government interference.

Independent group insurance systems may be easily changed to correct unsatisfactory conditions without political war or an act of Congress. Seven physicians out of every ten questioned by the American Institute of Public Opinion prior to the meeting of the American Medical Association in San Francisco replied in favor of the principle of health insurance without political control. Such systems have been working satisfactorily in railroad and other industrial organizations for years. Health insurance, handled either by labor and industry or by insurance companies already skilled in insurance technique, would, undoubtedly, be better than government control. We think that it is time for the Socio-Economic

Committees of the American Medical Association, American Hospital Association, and American Dental Association, to join forces with industry, labor, and insurance companies to develop the plans.

The Social Security Act.—The provisions for the care of crippled children in the Social Security Act, under which an attempt is being made to provide orthodontic treatment by federal grants to states, is proving itself to be a colossal failure. An earnest and conscientious effort has been made the last several years in California, especially by Dr. Will G. Sheffer in Santa Clara County, to test out the practicality of treating indigents in private practice as provided in the Crippled Children's Act. Owing to the vast number of indigent children needing orthodontic treatment, the per capita cost, and methods used in handling and treating these cases, it is undemocratic in principle and an extravagant expenditure of the taxpayer's money. It is not workable from a common-sense viewpoint, because of the problems of who is entitled to treatment, who is qualified, who will treat cases with little or no profits, bargaining of fees by welfare boards, by dentists, and by orthodontists.

The Committee is still of the opinion that dental orthopedic service should be authorized only through regularly recognized and approved charitable and educational institutions. It does not seem practical to us to adopt the policy of legalizing the assignment of seriously afflicted orthodontic cases through Public Welfare Boards. Only three states have statutory standards of proficiency for orthodontic practice. In two of these, the licensing system is not working effectively. Any dentist in any of the other 45 states has the legal right to represent himself as an orthodontist if he desires to solicit orthodontic patronage. Many states are amending their Crippled Children's Acts. It is the duty of all orthodontists to study these problems carefully. Justice is the important issue in these matters.

Supply and Demand.—Statistical information was offered on this subject in our 1937 report. Interested parties should refer to last year's report for these data. It should be pointed out that the number of dentists qualifying for orthodontic practice is continuing to show an upward trend, despite the depression of the past decade, while the other specialties of exodontia, pedodontia, and prosthodontia have been at a standstill.

Dental educators continue to sound a warning over the diminishing supply of dentists, due to increasing the curriculum to six years. Any marked reduction in the number of dental students each year probably would affect the specialty in relative proportion. There are indications, however, that any reduction which would come in this direction will probably be offset by the universities, which are attracting more and more students for graduate training.

With the return of general prosperity, a greatly increased demand for services should come, as a result of the accumulating number of those needing orthodontic services. A research investigation conducted by Dr. Louis Winston, Chairman of the Socio-Economic Committee for the Southwestern Society of Orthodontists, shows that there was, on the average, a gain of 13.8 per cent in 1936 over 1935, and a gain of 4.77 per cent in 1937 over 1936 in the number of cases placed under treatment. An average of 97 active cases per each individual was found. Thirteen per cent of these were reputed to have incomes of over \$10,000 a year; 26 per cent to have incomes of from \$5,000 to \$10,000 a year; 17 per cent to have incomes under \$2,000; and 5.6 per cent were charity cases. These figures were obtained from a relatively small number of reports gathered from well-established exclusive practitioners in several southwestern states. There was no reliable information on the average fees.

It is plainly evident that many practitioners are on a greatly reduced fee and are catering more and more to volume. We caution you to use careful judgment along these lines. Crowded orthodontic practices badly affect efficiency in obtaining corrections. The active treatment period is extended frequently, which results in a greater expense to the patient and less net income per case for the orthodontist. Orthodontic cases characteristically become economic liabilities after a reasonable length of time by exhausting the payer's spirit of cooperation. The charitable attitude of the practitioner to absorb more than his fair share of the different financial troubles for families he serves is another thing which greatly reduces income.

Tremendous and unnecessary losses are to be found in the average orthodontist's practice in bad accounts. They are allowed to accumulate, and grow so large that they look ridiculous when exposed to the fundamental principles of good business. The need for applying sound business methods to credit ratings and collections cannot be overemphasized. Many patients are allowed to become delinquent who should be forced to meet their obligations or dismissed. It is important that all orthodontists determine their average cost of doing business per income hour and check it against the average time expended on different classes of cases. It serves as an intelligent guide in establishing equitable fee scales.

Undergraduate Education.—A discussion of this subject would be mostly a repetition of our 1937 report. In this field lies the very foundation of orthodontic education, and it deserves real attention. If dental students do not come out of school with the proper understanding and conception of orthodontics, they become blunderers and stifle progress. The faculties appear to be taking a greater interest in this subject, and it is safe to assume that methods are gradually being improved for the teaching of the fundamentals of orthodontics. We urge all interested parties to refer to the reports of the Committee on Education for more detailed information.

Graduate Education.—During the past year this subject has attracted much editorial comment from those comprising the old and the new schools of thought. The passive, indifferent attitude of the dental profession toward this subject has finally been aroused. Appeals to professional opinion to help solve the problem of standardizing dental education in relation to specialized practice are having a wholesome effect. They are causing the members to think and reason things out on a logical basis for themselves, and the rank and file of dental practitioners are now rapidly learning that they should place their trust in the universities to supply this education.

Commercial and proprietary schools, though serving valuably in years past, have become outmoded. This does not mean that short courses of training are no longer practical. They are of real value to both the general practitioner and the specialist. Short courses in orthodontics for the general practitioner are founded on the premise of merely improving his working knowledge of his subject, and should not be recognized as adequate training for a specialized practice. A minimum of thirty semester hours or one college year should be definitely established as a standard, by placing the specialties under a special licensing system.

One of the principal objectives in the Constitution and By-Laws of the American Board of Orthodontia is to promote a better standardization of graduate training by setting up and announcing a list of approved schools. The committee feels that the Board should give serious consideration to this problem, as there appears to be an urgent need for better guidance in this field of education. It was not until a grading system was established that commercial dental schools passed away in favor of a sounder system. The Board, with its personnel, prestige, and financial income, is the logical agency to assume a large share of the responsibility in providing a better and more uniform standard for graduate training in orthodontics.

Special Legislation for Practice of the Specialties.—Dental organizations in three states, namely, Illinois, Tennessee, and Oklahoma, in recent years have succeeded in enacting laws which place the major specialties of dentistry under a supplementary licensing system. The object of the regulations is to force a termination of present conditions, under which any one who has been admitted to the general practice of dentistry may publicly represent himself to be an expert in a particular branch, irrespective of the validity of his claim. Constant misrepresentation in the special fields is resulting in notorious abuses of the public and of the professions' confidence. Those holding dental licenses, however, should be at liberty to practice any part of the accredited specialties, so long as it conforms to the regular routine of practice.

Recognizing that dentistry is a specialty of medicine, a physician may legally do any act within the field of dentistry, if that act is performed in a routine way for the treatment of disease or the relief of suffering. But, just as a physician without a license to practice dentistry may not lawfully represent himself to be a dentist, so also a dentist, who may justifiably regard himself as a specialist, should be obliged to demonstrate to the state examiners the validity of such a claim before being permitted to induce the public and his fel-

low-practitioners to believe it. As it is, every licensed dentist is free to hold himself out as a specialist in any branch of dentistry, without further examination by the official dental representatives of the state, or without license represent himself as an expert operator in any oral specialty.

There has been a regular legislative crusade taking place the last several years by state dental societies. These legislative programs have primarily been directed toward the complete extermination of the charlatans by the passage of drastic anti-advertising bills. All but three dental societies failed to realize that there was perhaps as much or more charlatanism being perpetrated under the guise of specialized services as any other. These amendments will prohibit unscrupulous advertising in the special branches, but some special branches are open to the adventurer to practice under false pretenses. They can use formal announcements, cards, telephone directory listings, and special notices. These abuses can be effectively controlled only by placing the specialties under a fair and reasonable statutory licensing system. It is likewise regrettable that these legislative committees fail to recognize the fact that one of the most vicious rackets in dentistry is the mail-order system of diagnosis and treatment, promoted by commercial orthodontics laboratories.

By placing one clause under the definition of dentistry, in a Dental Practice Act, the commercial laboratory is practically outlawed because every other provision of the Act regulating the practice of dentistry applies with equal force. The clause is as follows: "or diagnoses, makes and adjusts appliances to artificial casts of malposed teeth for treatment of the malposed teeth in the human mouth." It then follows that they must have a dental license. Should the state have a licensing system for the specialty, they must obtain an additional license to represent the specialty. The code prevents all kinds of dentists from doing any commercial advertising. The Oklahoma law specifically prohibits the advertising of this kind of service, by providing this clause in the code: "or in any way to advertise as having the ability to diagnose and prescribe treatment by use of impressions or casts made from natural teeth."

The technical procedure in drafting legislation of this character is so important that we urge all those interested in the advancement of this type of legislation to consult the Legislative Committee. It is important that prohibitory measures provided in one section should not be nullified by certain regulatory measures in another.

We should like to draw attention to the Illinois law, which is a striking example, as it requires a special license for those announcing themselves as specialists in one section and exempts commercial orthodontics diagnostic laboratories in another.

We should like to point out the wide variation in the fundamental requirements for qualifying by examination in three different state acts. The Oklahoma law requires that the applicant hold an Oklahoma Dental License and present proof that he has had thirty semester hours of graduate work in an approved college or university, or its equivalent. The applicant's special training and professional records undergo careful analysis in determining the equivalent of the thirty semester hours or one year of graduate training. These requirements were established to harmonize with the present-day standards of graduate training for special certification or a degree as evidence of the student's fitness for practice. A term of general practice is not mandatory. The Illinois law requires the applicant to be in general practice five years and to fulfill such other requirements as the Board elects. The Tennessee law requires three years in general practice and such other additional requirements as the Board may establish.

If legislation of this kind is to be advanced, it is fundamental that it coordinate with the approved standards of the Dental Educational Council of America and the American Universities Association, if real progress is to be made and justice performed.

These several acts were passed in 1935, and were included in the report of the Legislative Committee at the 1935 annual meeting. The committee at this time endorsed the Oklahoma provisions for regulation of the specialty. The Oklahoma Act, after three years' trial, has worked out entirely satisfactorily. Your present committee has, therefore, proceeded to advance and recommend the standards established by the Oklahoma 1935 Dental Act.

Equipment and Supplies.—There has been a substantial increase in the price of stationary equipment over the past eighteen months. The present controlled one-price standard is unfair, as it prohibits the practitioner from obtaining equipment to meet his special require-

ments. The extremely high price level, furthermore, discourages him from discarding old equipment for new. Dentists residing in districts having low incomes are compelled to buy the same priced equipment as those residing in Beverly Hills, or take outmoded second-hand outfits. A three-price equipment level is badly needed, such as may be seen in other lines of merchandise. The prices for the ordinary expendable materials are reasonable enough, but all the patented articles for orthodontic appliances are exceedingly high.

Patent Problem.—Nearly every year the Society is called upon to assist in the practical solution of some orthodontic patent problems. According to the present Principles of Medical and Dental Ethics, it is considered unprofessional to receive remuneration from any patented articles. Even though this has been the policy of the American Medical Association for about a quarter of a century, members have come to realize that some modification of this ruling is plainly indicated.

In 1934, a special committee of the American Association for the Advancement of Science recognized the desirability of obtaining patents for the purpose of control. It pointed out that the act of securing patents for medical discoveries is not unethical in itself, and that such an act does not mean that personal profits are sought. It recognized the desirability for a patent in order to protect a manufacturer who wished to develop a product on a large scale. It recognized the tremendous expense which might be involved in developing an invention and the use of a patent to recoup the money spent in research. It recognized, finally, the right of a university with limited funds for research to use patents developed in its laboratories for financing and encouraging further research. In effect, physicians have come to recognize that the profit motive plays an important part in the development of research.

Dr. Morris Fishbein, in a paper read before the American Chemical Society on September 7, 1937, advocated the setting up of a nonprofit holding corporation to administrate patents in the medical and health field. His paper is a very broad and comprehensive study of the whole situation. He declares that the new suggestion for control of medical patents seems necessary as an agency to standardize methods of control better. He refers to many universities and nonprofit research foundations and the diversified methods which they have been compelled to take in preventing capitalization and exploitation.

His plan calls for the establishment of a central corporate body, wholly altruistic in character, capable of administering medicinal patents for the benefit of the public, and assuring a reasonable remuneration to the investigator, the devotion of much of the profit to research, an adequate return to manufacturers who are willing to develop quantity, production and distribution in an ethical manner. It further provides for adequate clinical research in connection with the development of new products so that a premature launching of doubtful products on the medical profession or the public may be avoided. He further points out that the American Medical Association, with its prestige, with its central organization and available funds, is fully capable of developing such a corporation. This plan was expected to come before the Medical Association at the meeting recently held in San Francisco.

The American Dental Association has no facilities for controlling the present chaotic condition of the patent situation, except as a moral force. It is the opinion of the committee that the American Association of Orthodontists should look to the American Medical Association and the American Dental Association to take the lead in solving this complex problem. We do, however, think it advisable for the American Association of Orthodontists to have either a special or a standing Committee on Patents to study the situation. If the American Medical Association establishes a patent holding corporation, it might be possible for the American Association of Orthodontists to become a member. The Mellon Institute holds and administers 500 patents; so such a corporation should be able to handle all orthodontic patents. If not, it might develop and manage such a holding company of its own.

Commercial Orthodontics.—The crusade against the quack system of practicing orthodontics by mail has continued to absorb the attention of the Committee. You should be interested in knowing that all dental journals have supported us in our contentions except the *New York Dental Journal* and the *Dental Items of Interest*. Through the cooperation of an intermediary committee selected by the New York Society of Orthodontists composed of Dr. Joseph D. Eby, Dr. J. H. Frier, and Dr. S. E. Riesner, a most friendly and earnest effort has been made to obtain their cooperation.

In the case of the *New York Dental Journal*, it finally became necessary to ask for a hearing before their Board of Directors. Even though good and sufficient reasons were offered to justify the discontinuance of this objectionable advertising, our appeal was voted down. Among those presenting the negative side of the question were four orthodontists, namely: Drs. J. A. Salzmann, editor of the *Journal*, George Calloway, Sidney Riesner, and J. H. Frier. Two others, one a prosthodontist and the other a general practitioner, fought to the end to have the ad thrown out. All the others took the stand that the orthodontists were simply trying to protect themselves and take the rights of the general practitioner away from him. Their attitude seemed to be that if the practitioner wanted the laboratory to make a Jackson appliance or any other kind of an appliance, it was their own business, and nobody else had a right to interfere. Such a false conception of principle is analogous to declaring that those interested in the public and professional welfare have no right to force proper respect for legislation and codes of ethics to regulate the practice of dentistry. For the official journal of the First District Dental Society to lend its support to such a system of orthodontic practice is beyond our comprehension. The Board of Trustees of the American Dental Association is on record as opposing the acceptance of this kind of advertising by publishers who depend upon the profession for support. For them to adopt such a policy for the promotion of such a racket is equal in principle to an endorsement of the quack system of laboratories selling dentures by mail.

It is plainly evident that the affirmative side voted their personal prejudices in preference to voting the dictates of an ethical conscience, which should have the better things for dentistry at heart. According to their line of reasoning we would have to conclude that they do not care how their magazine chooses to have dentistry practiced. They simply have a false conception of our objective. Our contention is now, and always has been, that they have no moral right to advertising space in dental journals dedicated to public and professional welfare, and which are being financed by the earnings of the profession.

There is one thing we should like to make unmistakably clear: this movement is not intended to deny any dentist the right to practice orthodontics. He is granted this privilege by law, and in this we all agree. We do, however, maintain that the greatest responsibilities and obligations we have to perform are to protect the public and the profession. If the different branches fail to assume these responsibilities, nothing less than a chaotic condition will be the result of our negligence. We insist that organized dentistry and orthodontics should not stand idly by and allow themselves and the public to be exploited by sinister influences.

It is our firm conviction that dentists choosing to practice orthodontics can best serve the public and themselves by using their own knowledge and ability in combination with the consultation service offered by textbooks, scientific journals, and bona fide specialists within their reach, rather than to accept the teachings and influence of commercial orthodontic laboratories.

We maintain that any laboratory offering orthodontic appliances for sale by making and adjusting said appliances to casts made from the impression of the patient's teeth is necessarily diagnosing and prescribing treatment. The direct contact which is considered so necessary between the patient and the diagnostician and prescriber of treatment is lost.

Lengthy observation shows conclusively that the system and the methods employed are primarily for the purpose of selling appliances. The high percentage of failures and the damages recorded are a constant embarrassment to dentistry.

Negotiations with Dr. Mendel Nevins, president of the Dental Items of Interest Publishing Co., have been continued the past year in an effort to effect an agreement. Dr. Nevins agreed to discontinue carrying this objectionable advertising if we convinced him that it was a detriment to the public and the profession. Even though a special committee of the New York Society has carried on a continual correspondence and held personal interviews, he still refuses to rule them out.

In order to settle the problem, Dr. Nevins, in a letter dated June 2, to Dr. Joseph D. Eby, chairman of the New York Committee, has proposed that the issue be submitted to a committee of adjustment. According to the statement, he has not consulted the laboratories, but, should the idea meet a favorable response, he expects to do so.

The proposal is submitted under five points, as follows:

"1. As a dentist, I want to extend every courtesy and opportunity to all groups of specialists, but when censorship invades the freedom of the general practitioner, I want to be certain that it is for the best interest of the public as well as the profession at large.

"2. In view of this, I agree to submit the problem to a fairminded group whose integrity and intelligence are beyond reproach.

"3. Such a group should include the heads of reputable dental organizations in the area, such as the New York State, First and Second Districts, etc., as well as heads of the odontologists. Representatives of organizations should be general practitioners, as these representatives will be represented by their own group.

"4. I know that the heads of these Dental Societies are unselfish men whose past service to dentistry demonstrates their love for the profession. Therefore, I feel that they would be glad to devote two evenings of their time to review the entire matter.

"5. Finally, I will accept the decision of such a group as final, with the understanding that the decision is to be published by the *Dental Items of Interest*, as well as all other dental journals, along with a statement from you."

Further action by the committees representing odontologists is being held in abeyance for instructions from the American Association of Odontologists.

About a year or more ago a disgruntled advertiser who was denied space in *Dental Survey* filed a complaint with the Federal Trades Commission. The complaint is one of conspiracy. The legal definition of conspiracy is: "an agreement by which two or more persons confederate to do something unlawful." We, of course, conscientiously believe, through our own reasoning and that of competent legal advisors, that we have acted solely within our constitutional rights. We, therefore, have had no fear of the outcome and are continuing to exercise these rights in persuading the publishers to formulate advertising policies that harmonize with general statutes and our code of ethics relating to the subject.

Investigating attorneys for the Federal Trades Commission called on several of the principal parties last summer. Evidence to support our claims was assembled and submitted to the Federal Trades Commission as requested. Nothing more has been heard of the investigations.

Publicity Bureau.—It is plainly evident to all those seeking a solution to these serious problems that it can best be accomplished by an educational process. Our principal weakness in this connection lies in the fact that lectures and papers dealing with these subjects do not go much beyond the confines of our own specialty. By their repetition, we gain an intelligent viewpoint of these things, but we cannot expect those of the other allied professions and the public to deal with odontologic problems in an enlightened manner unless they are properly informed. All the papers and reports dealing with these problems become the property of the Society and appear only in the official journal and official transactions, whose circulation reaches little beyond those actively engaged in the practice of odontologies. They compose a very small minority group of the profession and public.

The need of a Publicity Bureau to convey information to our own members, those of the allied professions, and the public cannot be overemphasized.

The American Medical Society, the New York State Medical Society, the American Dental Association, the New York Society of Odontologists, and others have come to realize the necessity for the establishment of a bureau that functions all the year around. Many industrial and business organizations have found it expedient to employ full and part-time legislative agents to look after their interests.

The New York Society of Odontologists has been actively engaged in studying this problem since May, 1936. They employed Dwight Anderson, director of the Public Relations Bureau for the Medical Society of New York State, as publicity consultant. The Committee has reviewed much of Mr. Anderson's work and consulted members familiar with these projects in both the medical and the odontologic professions about his services. They are all enthusiastic about his qualifications and accomplishments. Two of the most recent releases by the Publicity Bureau of the New York Odontologic Society were the brochure entitled "The Purposes of Odontologies," and the reprint from the *AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY* on "Odontologic Education," by William J. Gies.

The development of such a service for the American Association of Orthodontists has successfully passed the organization and experimental stages. It has proved to be a worthy undertaking, and its only weakness may be attributed to the fact that it does not have a large number to share its moral and financial responsibilities. As the very nature of such a program deals with subjects of national concern, it should have national support. If it does not gain the support of the national organization dedicated to the advancement of orthodontics, it will grow weary under the load of carrying all the other orthodontists of the country free.

The New York Society of Orthodontists is petitioning the Association to assume control of this project. The plan has been submitted for the consideration of this organization, and it is the sincere hope of the Socio-Economics and the Legislative Committees that you look with favor on this proposition.

Expansion of Orthodontic Services.—The editors of two dental journals have recommended that orthodontic societies give serious consideration to the idea of organizing orthodontic consultation and treatment-planning service stations. They are offered as a substitute for the commercial laboratories and do not merit any consideration, for they would be promoting the very same system, under a different name, that orthodontic societies condemn.

Perhaps one of the best opportunities for making the orthodontic services of the specialist more available to the general practitioner and public is through a better appreciation and understanding of the value of a direct patient and dentist consultation service with the specialist. Capable orthodontists can now be found within easy reach of all those desiring the opinions and treatment assistance of trained and experienced specialists. It has been found that, where direct aid of a major character has been directly administered by capable specialists, a reasonable degree of success may be expected.

Better business methods for practice management should have special study.

Establishment of orthodontic clinics in properly recognized dental educational institutions and crippled children's hospitals should be encouraged for the indigent and the low wage earner.

Dentists having an aptitude for orthodontics should be encouraged to study for its practice.

T. W. SORRELS, Chairman
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Articles on oral surgery, radiography, and anesthesia should be submitted to Dr. Sterling V. Mead, 1149 Sixteenth Street Northwest, Washington, D. C. Articles on oral pathology should be submitted to Dr. Kurt H. Thoma, 47 Bay State Road, Boston, Mass.

ENDOCRINE DISTURBANCES AS RELATED TO PERIODONTAL DISEASE

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ETIOLOGY AND PATHOGENESIS

MANY authors have stated that tooth decay as well as pyorrhea is produced by chemical agents and by infectious agents; there is no uniformity of opinion at present on the subject. It is generally agreed, however, that an enormous number of factors can be productive of either caries or pyorrhea, and it has been shown time and time again that each can, under certain circumstances, bring about these conditions; but when other conditions prevail it has been found that they are not always etiological factors. A certain professor of dentistry, having worked out the possible combinations of a number of these causes, once seriously put forth the statement that there are 3,628,000 causes of dental caries. On the other hand, a dissolution of dental enamel must obviously always take place in a similar manner; consequently, these many and varied causes must all possess a common denominator which is the fundamental cause that we are seeking; and as soon as we discover this and find that it is opposite and antagonistic to the fundamental cause of pyorrhea, we have arrived at our goal.

Broderick is of the opinion that dental caries is essentially a chronic acidosis, which, by leading to an alteration in the reaction and buffer strength of the saliva, slowly and continuously decalcifies the tooth, whereas pyorrhea rests upon the basis of the possible attempt to compensate the effects of the chronic alkalosis, which, besides producing an immunity to caries through a high hypercalcification of the dental enamel, produces those changes which result in a destruction of alveolar bone without a destruction of gum tissues, and this is the essential feature in the production of pyorrhea; and at the same time altering the resistance of the tissues so that normal organisms saprophytic upon the body surface become parasitic and invade the damaged tissues. Although this hypothesis cannot be proved at present, it nevertheless satisfactorily explains all the facts. *This conception makes dental caries and pyorrhea not disease entities at all but just symptoms of a general constitutional disturbance.* Chronic acidosis and alkalosis are themselves but symptoms of a generalized upset and

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depend essentially upon metabolic factors which owe their origin to a lack of balance, either inherent or acquired, temporary or permanent, in the vegetative nervous system.

The individual metabolism of any particular person is dependent upon the balance which that patient possesses in the endocrine autonomic system; the parasympathetic, on the one hand, regulating and controlling the intake of food and oxygen, and the sympathetic, utilizing and expending the energy thus provided in the processes of life. Thus is the basic chemistry of the individual constituted which gives to him temperament and personality, his immunities and susceptibilities, and his whole reaction to the strains and stresses of life. An individual in whom the sympathetic portion of the vegetative nervous system tends to be overactive is bound eventually to suffer from a definite alteration of the body chemistry. Owing to the excess catabolism dependent upon the excessive energy expenditure, there will be an excessive production of acids, an excessive thyroid and adrenal activity with alteration in emotional threshold, a diminished permeability of capillaries, and a dehydration of the protein particles in the colloidal system; whereas with the increased activity of the parasympathetic, as compared with the sympathetic portion, an opposite chemical syndrome will present itself. In this case we shall have an overbalancing of the metabolic equation to the other extreme with excessive anabolism and diminished acid production, a relative alkalosis with lessened thyroid and adrenal activity and increased permeability of the capillaries and a hydration of protein particles of the first group, the sympathetic dominants, it will require much less strain to turn a potential acidosis into an actual one, and in the latter, stress of an opposite kind which would have no appreciable effect in a sympathetic dominant will tend to bring about an alkalosis. As a consequence of these practical chemical pictures, there will come about certain dystrophies, certain immunities, and certain susceptibilities of which *dental caries, on one hand, and pyorrhea, on the other, are typical examples.*

It must be remembered, however, that a vegetative nervous system has other functions to perform besides that of regulating metabolism by way of digestion, respiration, circulation, and elimination. This apparatus provides in fact the enervation of all involuntary tissues and organs of the body, and in its action is antagonistic, where one part stimulates a tissue or a gland, the other part inhibits. Thus, the sympathetic stimulates the heart and increases the pulse rate; whereas the vagus, which is part of the parasympathetic system, inhibits and slows the pulse. Now, if one part is overactive and thus overshadows its component, then stimulation and inhibition will be out of balance, function will be disturbed, as well as metabolism upset in the one or other direction, resulting in dental caries or pyorrhea dependent upon the same system. No functional disease is dependent upon bad teeth, but bad teeth and the functional disturbances are definitely related and have a bond of a common origin.

Instances of this will readily occur to anyone. As an illustration we shall cite the association of pyorrhea with gastric ulcer. The hyperchlorhydria which is the predominant factor in the production of gastric ulcer will depend upon excessive vagus stimulation and excessive attendant gastric digestion; an over-stressing of the anabolic side of the metabolism equation, will play some part in

the production of an alkalosis which may be safely assumed to be of essential significance in the etiology of pyorrhea. As a matter of fact, the very circumstances of hyperchlorhydria must be productive of an alkalosis from the fact that as the chlorine ion of the sodium chloride passes into the stomach in the form of hydrochloric acid, the sodium ion is left unbalanced in the blood, and being a base, will tend to disturb the acid-base balance in that direction; there occurs in fact an exaggeration of the normal alkaline tide of digestion. On the other hand, a hyperchlorhydria and possibly a gastric ulcer may be dependent upon a tendency to pyloric spasm. Here, however, the condition rests upon excessive sympathetic stimulation, a tendency to delay metabolism, and this type of lesion will be found associated with dental caries rather than with pyorrhea, and incidentally, with emotional disturbances.

There is just one instance taken at random to illustrate the interdependence of metabolic disturbance, on the one hand, and a dental lesion on the other, but in practically all functional diseases and organic diseases to which functional disease may eventually lead, the disturbances as a consequence of sympathetic predominance will be associated with caries while those of parasympathetic predominance with pyorrhea.

Another point which has not been sufficiently appreciated must be stressed: Intimately associated with the process of metabolism and therefore with the presence of one or the other dental lesion is the reaction of the body to infection. With an acute infection this is readily seen, in that the whole phenomenon of fever results from an excessive stimulation of the sympathetic portion of the vegetative system, causing an enormous outflow of energy in an attempt to overcome the invading parasites, with a corresponding inhibition of the parasympathetic function, digestion and so on, so that all available energy may be poured into the one channel.

With a chronic infection, however, this preliminary stimulation of the sympathetic is not marked, either because the invading bacteria are unable to stimulate this or because the sympathetic is incapable of sufficient stimulation. Consequently, the infection is not overcome but exists indefinitely, victory going neither to the invader nor to the invaded. This, rather than the matter of the lesser virulence of the invading organism, is the essential cause of an infection becoming chronic. For if an organism be not particularly virulent and the defensive mechanism is better equipped, there should be no difficulty in overcoming the parasite and a chronic infection should not exist at all. The very possibility of a chronic infection depends upon a disturbance of sympathetic-parasympathetic balance, and the part played by the organism is a very secondary one. But a chronic infection of dental origin must obviously follow either caries or pyorrhea, for a live tooth cannot have a periapical abscess, and the sepsis from the gingiva is the consequence of pyorrhea. Thus, we can bring together not only the dental lesion in its causation and functional disturbance, so often believed to be the cause of general disturbances, both being dependent essentially upon the same cause, not the general disease due to septic teeth but the bad teeth and the general symptoms due to the same underlying cause. The dental sepsis is only responsible in that this still further reduces vegetative efficiency.

Thus we see that there is an association between the type of dental lesion and the type of general disease to which a particular individual is susceptible and that this association rests upon a common origin, the connecting link being the vegetative status of the individual. Any steps taken to prevent the occurrence of a dental lesion will at the same time benefit the general cause, provided that the correct conception of the dental lesion is appreciated. But more than this, from the environmental circumstances of the teeth it will generally happen that the dental lesion shows itself before the general functional disturbance. Therefore, preventive dentistry with the proper association of causation, becomes preventive medicine, not through wholesale and ruthless extraction of teeth, good and bad together, but by correction of the vegetative status, which is a possibility; and prevention in distinction to dental surgery becomes the very spearhead of preventive medicine.

The mouth is an open document of enormous importance to the picture in an examination of the general metabolism of the patient, not only at the time of examination; but, what is much more important, it presents evidence of deviations from the normal which have occurred in past life. To the above it may be added that from the same examination a very good idea of the future health of the individual may be obtained if the circumstances underlying the dental measures which the mouth demonstrates are appreciated. This statement is based on the fact that predisposition to dental caries and to pyorrhea depends upon alterations in general metabolism along opposite lines. The very fact that either of these conditions is present or has existed at some previous time proves definitely that there is, or has existed, a tendency to alteration from the normal in the one or the other direction.

These alterations in metabolism are dependent in their ultimate origin upon imbalances in the endocrine autonomic system, upon the enervation of the various groups of organs controlling the functions of anabolism and catabolism, and upon conservation and expenditure of energy.

The predisposing cause of dental caries is a tendency to a change in the acid-base balance in the direction of an acidosis. Pyorrhea is a consequence of an attempt to compensate this state by an alkalosis. These two conditions, acidosis and alkalosis, and the ease with which they can come about will be dependent upon the strain, be this physical, physiological or psychological, to which the individual is subject, acting upon a constitutional diathesis which will be the consequence of the endocrine-autonomic balance of that particular person.

Although caries and pyorrhea are antagonistic conditions, it is possible to find both present at the same time in the same mouth; but, as a rule, in typical cases of pyorrhea caries is not notably active, and where caries is active, pyorrhea is usually nonexistent. Both caries and pyorrhea are a part of the disease picture, of a syndrome, the main feature of which is a disturbance in organic balance. Besides the systemic factors playing an etiological role in the origin of caries and pyorrhea, we must also consider local factors.

A systemic factor may or may not be present in a given case, whereas local causes are always present and active. A disturbance of the acid-base

balance by which the tissue fluids become more alkaline than normal probably constitutes the underlying systemic cause of periodontoclasia. How potent a factor this may be in a given case, no one can say. In most cases it is little more than a predisposing cause which in the absence of unfavorable local conditions would not of itself seriously affect the periodontal tissues. Many cases, on the other hand, can be explained on the basis of local causation only. Such local factors are numerous, including frail alveolar process, malocclusion, irregularly distributed occlusal relations, loss of teeth, malformation, lowered resistance of the periodontal tissues, and infection. The most potent factors are lowered resistance of the periodontal tissues and infection.

Some authors believe, however, that the so-called periodontitis, previously designated as alveolar pyorrhea, is a disease not of the teeth themselves, which are completely healthy and may remain so, but of the tissue surrounding the teeth, of the gums, the alveolar process, the so-called periodontium which gradually becomes destroyed, leading eventually to loosening and finally to a loss of teeth. An involvement of a single tooth is rare, but as a rule a group of teeth or all the teeth of the mouth are affected.

Pathologically and autonomically one deals here with inflammatory processes which appear in the region of the bones as a rarefying osteitis, destroying the bones and transforming the neighboring subtissues into inflammatory granulation tissue. Because of the above, the tooth loses its support and falls out. There is no uniformity of opinion in regard to the significance of inflammation. Some authors assume that the degenerative changes in the alveolar process represent a primary cause of the disease and that the inflammatory phenomena appear secondarily, while other authors consider the degenerative changes in the bony tissue simply a consequence of an inflammation of the marginal gum tissues, which alone is constantly subjected to various types of inflammation and its consequences. The latter therefore designate the disease as a periodontitis. Adloff is of the opinion that inflammation plays a secondary role and that degeneration is a primary factor. He bases his opinion on the fact that in old individuals the teeth may fall out in the absence of any inflammatory process and that here one deals essentially with a senile alveolar atrophy, with a periodontitis. The same holds true for the so-called presenile atrophy which is a periodontitis in the same sense, although here it appears at a time at which senile changes are as a rule as yet absent. But also these original genuine periodontoses occur frequently under a picture of periodontitis, and since the latter is almost always a disease of later life while senile changes may appear relatively early in various organs, one is justified to consider processes of periodontitis occurring in individuals past thirty years as the result of natural degenerative processes only complicated by a secondary inflammation. This viewpoint is essential for the therapy and prognosis.

A genuine periodontitis without inflammatory symptoms is scarcely ever encountered. One must always consider the inflammation with its sequelae which dominate the picture. Therefore, each gingivitis may lead to a periodontitis and each periodontitis may originate from a gingivitis. In many individuals conditions exist which should favor the development of the disease al-

though the mouth remains normal; while in others in the absence of these conditions the mouth is diseased. Under general conditions the development or nondevelopment of an infection depends primarily on the resistance of the organism, and on endogenous constitutional factors. This different degree of resistance is the cause of the individually so varied appearance of periodontitis, since the latter is highly independent of external conditions. Other factors, however, may influence and affect it in various ways. There is practically no single systemic disturbance which could not be related with periodontitis. Endocrine disturbances, circulatory and metabolic affections, changes in the vegetative nervous system, avitaminosis, even disturbances in the psychic equilibrium may be related to a great extent with periodontitis. There is more than a possibility that disturbances of the above-mentioned type may indirectly lead to the development of degenerative processes at the margin of the alveolar bone in the sense of a genuine periodontitis. Practically there is found only a periodontitis, even if the phenomenon of inflammation has largely subsided and even though the inflammation always creates the typical disease picture observed to the practicing physician. The general condition of the patient at the time the infection is found has undoubtedly a significant influence on its course and on the prognosis of the periodontitis.

TYPES, CLASSIFICATION, DIFFERENTIATING TRAITS

Since 1746 the conception of pyorrhea has been enlarged in that it began to be considered in the sense of a constitutional osteopathy. The presence of pus is not necessarily characteristic of pyorrhea. Ordinary gingivitis may gradually pass into a marginal suppuration. The modern conception of pyorrhea also includes the tendency to shrinkage of the periodontal tissues and the effect on the mouth as a result of this shrinkage. The expression "periodontitis" implies that one deals here not with a purely local and exogenous condition of the disease but with a general constitutional disturbance leading to a loss of tissue. Recently, the term "marginal suppurative gingivitis" and the term "alveolar pyorrhea" have been differentiated into periodontitis and senile and precocious atrophy. The term periodontitis includes all affections of the periodontium associated with the loss of tissue independent of etiology; it comprises, therefore, the simple periodontitis with the local findings, such as deepening of the gum pockets, suppurative inflammation with the loosening of the teeth, the diffuse dystrophic periodontitis with the local findings of irregular atrophy, accompanied by suppuration and loosening of the teeth, the complex dystrophic periodontitis associated locally with a deepening of the gum pockets, with suppuration and eventual loosening of the teeth.

Suppuration is not essential, but pocket formation, that is, the deepening of the sulcus between the margin of the gum and the tooth, is just as essential as the dystrophy and atrophy. All these forms terminate in the third complex picture of the destructive pyorrhea process with suppurative pockets, ulcerative decomposition of the gum tissue, exposure of the roots of the teeth, granulating osteitis in the apical periodontium, loosening and falling out of the teeth.

In the early stages, even in the pure forms not secondarily complicated clinically, signs of inflammation may be absent so that a condition similar to that

of senile atrophy and loss of tissue of the bones and of the gums dominate the picture.

In regard to the atrophic form, one must differentiate total atrophy from the type of senile and presenile atrophy, as well as from partial atrophy. In the atrophic form the loss of gum tissue and of bony tissue goes hand in hand with the deepening of the epithelial insertion; in the senile and presenile form the atrophy of the gum tissue is not parallel to the depth of the level of the bony tissue; under these conditions there develop supraalveolar gum pockets or the marginal alveolar wall regresses. In the latter case there develops a dilatation of the periodontal space of the type that a roentgen picture reveals and known as evidence of vertical atrophy.

The pure presenile atrophy is essentially the result of disturbances in the anabolism and catabolism of the bone tissue. Age and constitution disturb the equalization between these two processes or favor functional decomposition. Similarly, a vertical atrophy without an inflammation may be explained by an increase in functional decomposition. The effect of forces on the working tooth must be expressed in the hydraulic pressure effects on the lymph and blood vessels contained in the interligamentary column in that as a result of absorption processes the alveolar wall becomes decomposed and the bundles of the fiber system degenerate. When these proliferative and degenerative ligamentary changes course under a picture of inflammation, this is further complicated by secondary bacterial and toxic injuries.

Cahen studied the basal metabolism and the specific dynamic effect of proteins on 233 patients suffering from various types of pyorrhea. In 219 of these the specific dynamic action of proteins was determined. Previous studies carried out by Wienmann have shown that the disease is clinically characterized by a decrease of the specific dynamic action of proteins in about 90 per cent of the cases. Similar studies were carried out by Lebermann on 20 patients. Two of these 20 patients also presented a diffuse atrophy of the gum and bony tissue. One of these two showed a decreased specific dynamic action of proteins. In my own cases of diffuse atrophy the specific dynamic action of proteins was decreased in 90 per cent. The specific dynamic action was decreased in only 4 per cent of the cases of alveolar pyorrhea where a diffuse atrophy was absent. In consideration of these findings one is justified to assume that some disturbance in the hypophysis may play a causative role in the origin of alveolar pyorrhea. A study of the calcium content of the serum is demonstrable in most cases of alveolar pyorrhea complicated by diffuse atrophy. Similarly, in the cases complicated by diffuse atrophy an elevation in the blood sugar value was obtained.

On the basis of the above mentioned findings one is justified in concluding that in cases of alveolar pyorrhea associated with diffuse atrophy there are found a series of pathological changes, in contrast to the simple cases of alveolar pyorrhea where pathological changes are not demonstrable. This would indicate the necessity of more strict differentiation of types of alveolar pyorrhea in so far as in certain types general affections are more common.

TREATMENT

The very fact that there are numberless methods for the treatment of pyorrhea indicates that no satisfactory single method is perfect. Most of the methods lead to some improvement of the condition, although none of them lead to a complete cure; this is partly due to the fact that the pyorrhea is varied in nature. It is generally agreed that before actual treatment could be instituted, hygienic measures must be carried out; the treatment of pyorrhea may be compared with the treatment of some stomach affection; in the latter, before surgery is instituted, the surgeon makes sure that the stomach is empty and clear; similarly, in pyorrhea, before the treatment is instituted prophylaxis is essential. Of the therapeutic methods employed the following may be mentioned: (1) surgical, consisting of an incision of the gingiva followed by cautery; (2) biological, consisting of administration of polyvalent vaccines; (3) chemical, consisting in the application of sulfuric acid and other types of acids for purposes of cauterization of the dead and decomposing tissues; and (4) electrical, chiefly in the form of diathermy. According to some authors best results are obtained from the employment of a combination of several of the methods outlined above. Most authors are of the opinion that the prevention of the development of pyorrhea is of great significance. Unfortunately, the patient is usually seen when the condition is highly advanced. The treatment of alveolar pyorrhea must be general and local. The general treatment is directed toward an improvement of the patient's physical condition. The local treatment consists of surgical measures directed toward the elimination of the injured tissue.

To the dentist who sees with eyes of the heart, the problem of dental health becomes the mainspring of his existence. He cannot rest content with the cure of established periodontal lesions, the restoration of lost tooth structure, or even the prevention of these conditions for the few who bring to him his daily bread. He must look out and beyond the confines of those with whom he comes in contact. To see the ravages of disease is to feel the call to the service of mankind.

1220 16TH ST., N. W.

INTRAVENOUS ANESTHESIA IN ORAL SURGERY*

BARKLEY S. WYCKOFF, D.D.S., SANTA BARBARA, CALIF.

THE two discoveries which probably aided modern surgery the most are the germ theory of disease and the discovery of sulfuric ether as an anesthetic agent. I shall not dwell on the history of inhalation anesthetics, such as ether and nitrous oxide, since every student of the history of dentistry knows the names of Wells and Morton and the rôle dentistry has played in developing these anesthetic agents. I should, however, like to discuss for a few minutes the physiologic action of inhalation anesthetics. According to Cohen-Githens, they may be divided into two classes: (1) the volatile agents including chloroform, ether, ethyl chloride, et cetera, and (2) the gaseous ones such as nitrous oxide, ethylene, and cyclopropane. Those of the first group are inhaled in relatively small amounts in the atmospheric air and derive their narcotic effect from a chemical action on the nerve cells. Those of the second group are inhaled in much greater concentration, 85 to 95 per cent mixed with but 5 to 15 per cent oxygen. In such concentration they greatly interfere with normal tissue oxidation and are thought to produce anesthesia by asphyxiation of the higher nerve centers. Nevertheless any of the agents in either group when properly administered to patients in whom there are no contraindications for their use, are very satisfactory anesthetics.

Because of the frequent contraindications to their use and the expense and training necessary for their safe administration, a third type of anesthesia appeared; namely, the local anesthetics. Koller¹ in 1884 demonstrated the use of cocaine as a local anesthetic. Since then efforts have been made to improve its use along three main lines: (1) to increase the topical effect of the drug, (2) to seek substances safer and less toxic than cocaine, (3) to perfect the manner of its administration. You are all aware of the improvements made in local anesthesia, both in the drugs themselves and in the various techniques of their application.

A fourth type of anesthesia has now become available which we will call intravenous anesthesia. This type of anesthesia has long been used in experimental work. It was used in Europe on human patients long before it was taken up in this country. Curiously enough it embraces in part the qualities of both the other types: in that it is a general anesthetic, one which produces complete narcosis, and in that it is administered in the same fashion as a local anesthetic, by injection. I shall limit my remarks to the use of evipal soluble (Winthrop), a trade name given this particular barbiturate by the manufacturer. There are other similar products on the market equally good.

Intravenous evipal soluble is not new in the true sense of the word but is the result of the attempt of research workers to find a quick acting, safe, intravenous anesthetic which also would have a fast recovery. Evipal is a barbituric

*From the Sansum Clinic.

Read before Santa Barbara District Dental Society, November, 1937.

acid compound that has been developed in the laboratory. To date, it seems to have the essential factors required of a safe anesthetic.

A review of the literature shows that German and English workers have used this drug in dental and oral operations much more than it has been used in this country. McIntosh² has given more than 500 anesthetics for various dental operations. If the patient is of average health, they have no compunction about giving this drug in the upright position. Jarman and Abel³ report 2,000 anesthetics with evipal soluble. They have had no fatalities, and no pathologic processes seem to have been exaggerated by its use. The Findlays⁴ reported having given this drug to one patient ten times for a series of furuncles with apparently no deleterious effects. They have also reported recently a series of 100 cases, seven of which were given for this writer, thus stimulating his interest in its use.

For the average dental practitioner the uses of evipal are limited, but in a specialized practice where facilities for handling patients following a general anesthetic are available, it does become practical. The drug is injected as a 10 per cent aqueous solution. As a sodium salt, evipal dissolves readily in water; however, since its solutions are not stable, it should be freshly prepared. It is dispensed as a powder in ampules containing one gram. This one gram when added to 10 ml. of sterile distilled water results in the 10 per cent solution.

A suitable vein in the arm is selected, a tourniquet is applied and the injection is made the same as any other intravenous injection. The patient should be in a supine or semisupine position and not upright. For convenience in oral work, a mouth prop should be introduced when the anesthetic is started. This facilitates opening the mouth with greater ease and also allows the operator to keep the tongue well forward as it is very apt to fall back in the throat. Many writers comment on the relaxation which appears in the muscles of mastication. In this series of cases, I noted this event in only two, possibly because of the small doses given most of these patients (14 ml. was the largest single dose).

At the moment the injection is started, the patient is requested to start counting aloud. Within the first 30 seconds after the first 2 ml. have been administered, the patient usually exhibits the drowsy effect. Complete amnesia seems to start at this point. Very often there is a momentary secession of breathing or very shallow breathing which may last for one minute followed by a deep rhythmic rate which is quite audible. No harmful effects have been noted if a little leakage occurred around the vein. The quickness and quietness which accompanies this anesthetic are spectacular. There is no excitement stage which often accompanies inhalation anesthetics. The time of recovery depends upon the amount given and upon the individual patient. In this series four minutes was the shortest period of recovery and forty minutes the longest. By recovery is meant the point at which the patient can answer intelligently a given question, and realizes that he has been asleep. However, the time varies before they are ambulatory, one or two hours often being required before they have completely recovered. In only one case was a supplementary anesthetic used. Novocaine, 2 per cent, with adrenalin was used in an impaction to control bleeding. It has also been found practical to keep the needle in the vein so that deeper anesthesia or a more prolonged one may be obtained with ease. This also tends

to keep the dosage down as it may be administered slowly during the operation if necessary. It can be given by the dental operator with the aid of untrained assistants, but this places added responsibilities and duties on the individual whose time is already at a premium.

The operative technique under this anesthetic is identical to that under any general anesthesia. The first step after complete anesthesia has been obtained is to pack the throat to prevent the aspiration of any materials in the trachea and the swallowing of blood and mucus. In very light cases the swallowing reflex may be present, and in that event the necessity of keeping the tongue well forward is eliminated. As I stated before, in my experience it is better to place the mouth prop before the patient loses consciousness.

After the operation has been completed, the patient should be observed until the swallowing and corneal reflexes have returned. Patients may be moved to the rest room, but should not be dismissed from the office until they are quite normal. It is not wise to allow them to drive a car for several hours, as their reaction time is slow.

Anesthesia of this type is produced by its depressing effect upon the higher nerve centers. It is a cerebral depressor. In experimental work overdosage has produced death of the animal by respiratory failure. Kennedy and Narayana⁵ were able to reactivate the heart muscle after nine minutes of failure to beat by placing it in Ringer's solution containing four drops of adrenalin. They concluded that no permanent cardiac damage was done. In moderate cases of overdosage the animal was kept alive by means of artificial respiration.

Artificial respiration, carbon dioxide, and coramine should be used in the event of overdosage. The relative merit of coramine is debatable, and many authorities do not place much value in this drug. All agree, however, that artificial respiration is efficacious. There are certain types of individuals in whom the use of intravenous anesthetics of this type should not be used: (1) in the very elderly, (2) in the very young, (3) in cases of extreme sepsis, (4) in any patient in whom there may be any liver damage present, as this drug is detoxified in the liver.

Regarding its merits as an anesthetic: (1) It produces complete amnesia; therefore it is excellent for the apprehensive patient. (2) The patient goes to sleep quickly and quietly; there is no sensation of suffocation. (3) No post-operative nausea is encountered. (4) In fracture work it is especially advantageous.

I do not mean to infer in this paper that intravenous anesthetics should replace other types of anesthesia, but that they do have a definite place in the field of anesthesia.

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ELONGATION OF THE PARTIALLY CLEFT PALATE*

JAMES BARRETT BROWN, M.D., F.A.C.S., ST. LOUIS, MO.

IN THE repair of cleft palates one goal should be to obtain the best possible function of the soft palate. This will require pliable tissue, sufficiently long to meet the posterior wall of the pharynx (Passavant's pad) in the sphincter-like action of this region that closes the opening between the nose and throat. Although operations may be well executed and the palates may appear normal after operation, it is extremely exceptional that perfect speech is obtained. This persistent speech defect is probably due to a leak of air into the nose which may occur if there is an opening left of only a millimeter.

In efforts to insure complete closure, methods have been described for gaining length in the palate or for carrying the posterior pharyngeal wall forward. These procedures have been completely summarized by Dorrance in *The Operative Story of Cleft Palate* and need only mentioning here.

Elongations have been done by freshening the edges of the posterior pillars, detaching them low down in the pharynx and then suturing them together in midline, thus extending the palate behind the uvula; this has effected good results in many cases, but tissue that is normally a tensor of the palate is changed around so that the levators pull it up in closure of the opening. Blair has put rectangular flaps from the cheeks across the palate after it has been dissected backward, but the procedure is somewhat formidable for the gain involved. Gillies and Fry have described a backward dissection of the palate with an apparatus to hold a skin graft on the raw surface, the resultant opening into the nose in the front part to be closed by an obturator.

Some think that in complete clefts an operation of the Dieffenbach principle may be executed to allow moving backward of the entire palate, but, if any great displacement is done, a hole persists in the front part of the palate. Others have even sacrificed the closure in front in order to have the tissue available posteriorly and have then used obturators for the anterior opening or have brought in flaps from a distance.

After closure of the palate, several surgeons have directed their attention to carrying the posterior pharyngeal wall forward: by reefing it forward, by the use of a submucosal prosthesis, and by rectangular mucous flaps dissected free from the pharynx and attached to the soft palate (Padgett and Wardhill). Any of these measures, especially the reefing forward of the posterior wall, can be added to this procedure if the operator so desires.

Palates that are cleft only through the soft tissue or on up, part way through the bone, may have actually less tissue for repair of the soft palate than those with complete clefts; and there are also patients with uncleft palates that are so

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*From the Department of Surgery, Washington University School of Medicine.

abnormally short that speech is just as bad as though the palate were cleft. Dorrance has called this "congenital insufficiency of the palate." It is in this group that the most direct attempts have been made for actually lengthening the palate, by moving the whole of the soft tissues backward and still having the bony palate in front to separate the nose and the mouth. Dorrance's procedure which he calls the "push-back operation" is probably the best known. The essentials are that a delayed flap of the entire covering of the bony palate is made except that the major palatine arteries are sacrificed. At a later operation the mucoperiosteum is again raised from the bone and the whole mass is "pushed back" so that the anterior edge of the flap may be anchored as far back as the posterior bony edge. The cleft is closed and the anterior denuded bone is left to heal over.

AUTHOR'S TECHNIQUE FOR LENGTHENING THE PARTIALLY CLEFT PALATE

Our interest in the problem of obtaining the longest possible palate has fluctuated with the results obtained with various procedures, but since September, 1931 (after Dorrance's first report of his technique), we have used the procedure outlined here. The principle is that a direct flap of practically the entire palate is raised completely free from the bone and is immediately set back so that the anterior free edge is anchored clear back at the posterior edge of the bone. The major palatine arteries are definitely preserved and left to supply the palatine flap. The palate is allowed to heal here, the bony palate to cover completely with epithelium and, at a second operation, the palate cleft itself is closed.

First Operation.—An incision is made across the surface of the anterior pillar, over the ramus and onto the maxillary tubercle; it is then carried entirely around the palate against the alveolus and out over the opposite side (Fig. 1).*

An elevator is used to detach the mucoperiosteum completely from the bone, and the arteries are carefully preserved. When the posterior edge of the bone is reached, the nasal mucosa is carefully opened and a narrow edge is left attached to the bone to be used for the anchoring sutures that are put in later (Fig. 2). The elevator is put behind the arteries, and the space down to the hamulus and pterygoid plate is opened so that the surface and deep soft tissues throughout the entire extent of the incision may be freely mobilized. The tensor muscle may be divided at the hamulus, and the dissection of the aponeurosis from the posterior edge of the bone is completed so that the entire mass of palate tissue is held by the remaining uncut surface over the pillars, the major arteries and the levators. At this stage, in spite of the very free dissection, it is interesting to note that the levators are still active (Fig. 3).

The arteries are then elongated by carefully stretching them from their foramina and slightly separating them from the raw surface of the palate. We are convinced that this procedure can be successfully carried out as we have done it throughout this series, and we do practically the same thing in repairing total clefts.†

*All illustrations are diagrammatic; drawn as though the palate were viewed from below instead of through the open mouth.

†Blair, V. P., and Brown, J. B.: The Dieffenbach-Warren Operation for Closure of the Congenitally Cleft Palate, *Surg. Gynec. & Obst.* 59: 309-320, 1934.

When the palate is quite free and movable, the anterior cut edge is sewed clear back at the posterior bony edge, being anchored, with a horse-hair suture, to the little flap of nasal mucosa that is left attached here. The lateral free edge

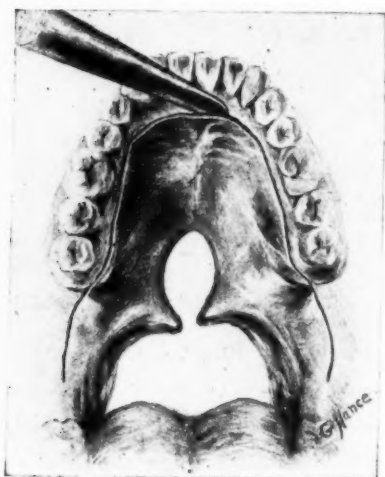


Fig. 1.

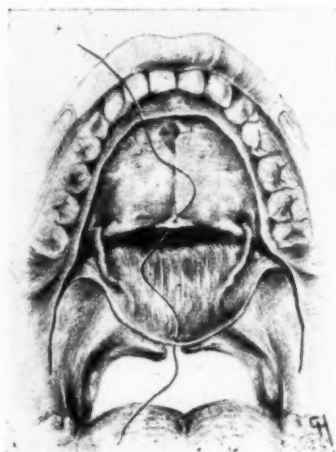


Fig. 2.

Fig. 1.—Line of incision and beginning elevation of mucoperiosteum.

Fig. 2.—Diagrammatic representation of palate completely detached from bone, both major palatine arteries intact, and preservation of a band of nasal mucosa to which the palate is attached with the first suture as shown.



Fig. 3.

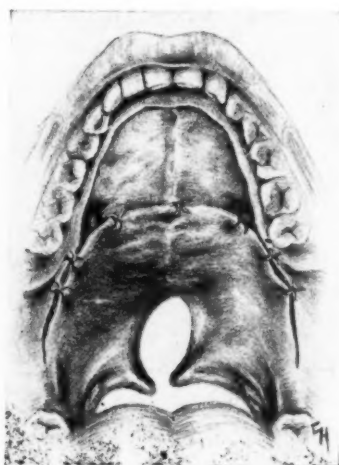


Fig. 4.

Fig. 3.—Detail diagram of deep separation of the soft tissues, exposure of the hamulus, freeing of the palate aponeurosis in this area behind the artery, section of the tensor tendon.

Fig. 4.—Completion of first stage. The palate has been set back and anchored with horsehair sutures as shown. Several layers of iodoform and balsam of Peru gauze are placed smoothly over the exposed bone and will be retained without sutures for several days.

of the flap is then anchored at the maxillary tubercle on each side, and one or two more sutures may be inserted (Fig. 4).

The tissue is usually somewhat humped up, but it is definitely longer and the halves of the soft palate may be lying in contact with the posterior wall. The

anterior defect is covered smoothly with a pack of balsam of Peru and iodoform gauze, and no sutures are necessary to retain it.

If indicated, a tonsillectomy and adenoidectomy is done at the start of this operation.

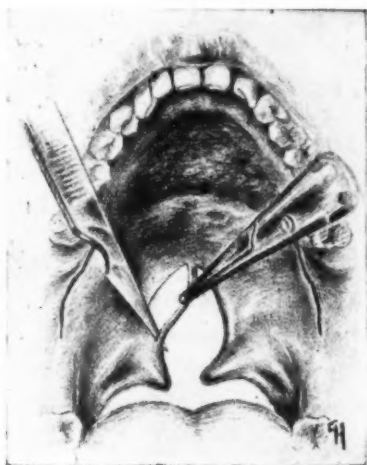


Fig. 5.

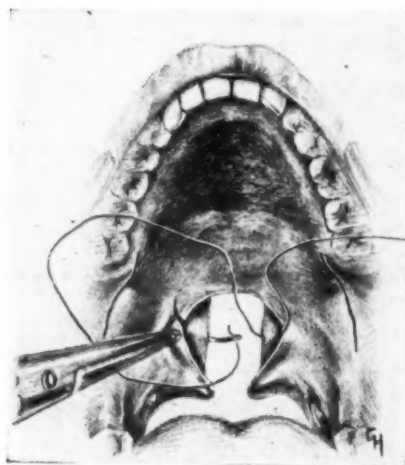


Fig. 6.

Fig. 5.—Beginning of second stage. New openings through the former lateral incisions may or may not be thought necessary. The edge is trimmed off from the tip of the uvula up into the palate substance about 2 mm.

Fig. 6.—A deep stay suture is usually placed to engage a good bulk of tissue. This may be of catgut and tied on the nasal surface or it may be of nonabsorbable material and brought out into the mouth. Extra muscle and nasal mucosa sutures may be put in at this stage.

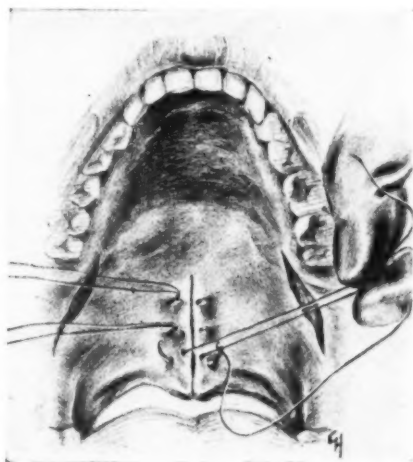


Fig. 7.

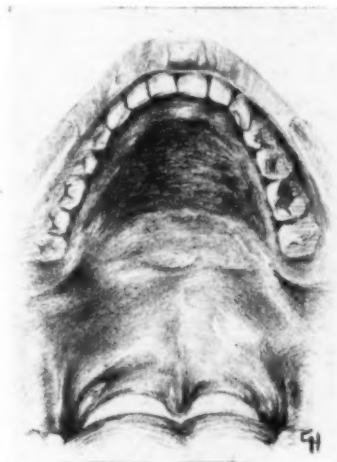


Fig. 8.

Fig. 7.—Closure of the cleft with vertical mattress sutures of horsehair. The closure is carried entirely around the uvula and then up onto the nasal surface with fine catgut sutures.

Fig. 8.—Completed and healed palate. Set back the distance of the original exposed bone shown in Fig. 4, minus the folding of the soft tissue and the contraction in healing. It is not possible to tell by looking at the palate whether or not it completely closes the nasopharynx, but, of course, the greater its length, the better is its chance of doing so, provided the levator muscles are functioning.

Recovery is usually prompt and the patient can leave the hospital in three to seven days. The pack is removed about the sixth day, and repacking is occasionally necessary for bleeding.

Complete healing of epithelium over the bony palate occurs in twenty to thirty days, and is practically normal in appearance except that rugae are not present. At this stage the soft tissues may be somewhat humped up from side to side just behind the edge of the bone. The actual lengthening might be said to be the difference between what tissue is used in this humping up and the total distance the edge is set back. This distance may be as much as 2 cm., and is the space between the anterior incision to the posterior edge of the bone. Improvement in speech is usually already noted even though the cleft is not completely closed.

Second Operation.—The cleft in the palate is closed as desired, either by simply freshening the edges and suturing them or by first undermining through new lateral incisions to gain any necessary mobilization (Figs. 5, 6, and 7). This stage may frequently be combined with the first stage, so that only one operation is necessary.

RESULTS OF TREATMENT AND QUALIFICATIONS OF THE PROCEDURE

By this time I had hoped to report on more patients; however, over the five-year period, observations even on this small group may be worthy of evaluation.

1. In 53 operations performed on 32 patients, there have been no deaths; 25 of these have shown excellent results and the 7 others have not had the final step completed.

2. Hemorrhage occurred from the incisive canal, so severe in one adult that operation was discontinued and completed at a later date when more attention was paid to her preoperative care. Hemorrhage occurred in one patient following the removal of the pack but was easily controlled with another pack.

3. If there is interruption of the blood supply of the major arteries either when operation is done, or if a previous operative attempt has sacrificed them, it will perhaps be best to revert to a "delayed flap" type of operation, as described by Dorrance rather than to set the palate back at the first operation. In one patient there was a small slough anteriorly due either to sacrificing an artery inadvertently or to its being kinked in its new position.

4. Palates badly scarred from former operations cannot be expected to submit to manipulation as readily as unscarred ones.

5. If there is a bony defect extending up the center of the palate, very careful separation of the flap should be done to preserve the nasal mucosa, otherwise a hole will be left anteriorly. The limits of the bony edge or the possibility of a long, narrow central cleft can be determined with a fine hypodermic needle if desired before operation. In one of the 6 uncompleted cases, an attempt was made to lengthen a completely cleft palate that had already been closed, and a defect resulted anteriorly that may require an obturator.

6. If the operation is done too early in life, any tooth buds outside the alveolus may be damaged, the same as in any other operation, as has been emphasized by Logan and Kronfeld. Eight months is the age of the youngest in this group, and operation was done only at the insistence of the parents.

7. One patient who had a neuronitis and whose mentality did not offer much hope of success, developed such excellent speech that he was able to be understood in reciting a short poem to a large audience.

8. All the older patients have expressed great appreciation and have felt definite improvement in speech. One western ranch hand, undoubtedly the subject of much ridicule, stated that he was able for the first time really to get by with his work, and to direct others at work.

9. Both stages have been completed in one operation, but the two separate stages are relatively easy ones for the patient.

10. One patient with a very short soft palate cleft that had been closed elsewhere was set back as far as possible with preservation of both arteries, and when, after it had completely healed, it was found that still further length could be gained, it was set back again and the arteries were definitely preserved at this time also.

11. In a girl of 10 years there was practically no bony palate whatever and a corresponding lack of soft tissue with extreme width of the cleft so that it did not seem that any type of closure could be obtained. However, in this patient, even the short setback obtained at the first operation made subsequent closure of the cleft possible and, though the final palate was short, there was marked improvement in the child's speech and eating.

12. A possible objection to this procedure is that the resulting raw nasal surface may contract and shorten the palate secondarily, but so far we have not noted this as being important enough to try to cover the raw surfaces with skin grafts.

13. This procedure seems to be adaptable to a small percentage (possibly about 20 per cent) of the total cases, but as its steps can be changed around, or combined in one operation, and, as the first stage may be used to elongate partial clefts already closed, its usefulness may be increased. It is also possible that palates with total clefts that have been closed can be lengthened, either by preserving the nasal mucosa anteriorly to permit of spontaneous healing or by using an obturator on a dental prosthesis.

14. No claim is made that perfect closure is to be routinely expected, but it is thought that results thus far have been very encouraging. Speech training is considered as important as in any other type of palate closure.

PAPILLOMA

W. HARRY GULLIFER,* D.M.D., BOSTON, MASS.

THE papilloma is an epithelial growth consisting of hyperplastic papillae of epithelium which do not penetrate the basement membrane, but extend into the underlying connective tissue.

Inflammatory cells such as polymorphonuclear leucocytes, lymphocytes, and plasma cells are present frequently, but not always, in the microscopic section. Their presence indicates chronic inflammation either from bacterial causes or other irritants or from hemorrhage.

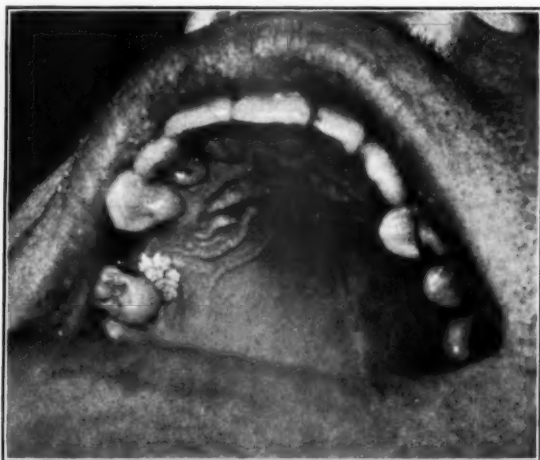


Fig. 1.—Photograph of papilloma in right second premolar region of the maxilla. This is a hard, raised, grayish, pearl-like cauliflower tumor. First premolar on this side was extracted seven years previously.

Two types are found in the mouth: the soft, red, furry type which bleeds easily and is seen occasionally extending from the cheek to the soft palate; and the hard, keratinized, hornlike, cauliflower type. In true papilloma there is no induration at the base of the lesion. The rate of growth is slow. The lesion may have a broad base attachment or may be pedunculated. They may be found growing from any of the epithelial surfaces of the oral mucous membrane or tongue.

Although benign growths, they should be considered lesions which may lead to carcinoma if other factors are favorable. Treatment, therefore, should be excision with a margin of healthy tissue by the electrocoagulating cautery (electrothermic method).

*Assistant Visiting Oral Surgeon, Boston City Hospital.

CASE REPORT

Patient: E. F., white, male, age 35 years.

Diagnosis.—Papilloma of right maxilla, palatal surface adjacent to right second premolar.

Family History.—Father and mother dead. Father died at age of 75 years of carcinoma of the lungs. Father had epithelioma of skin below ear which was treated and arrested by radium. Mother died at 75 years of age following an injury as the result of a fall. Patient has two half brothers and two half sisters living and well.



Fig. 2.—Gross specimen after removal by high frequency cutting current.



Fig. 3.—Low power photomicrograph showing proliferation of the epithelium into the underlying connective tissue. This proliferation is uniform, however, and does not extend beyond the basement membrane. In the center of the section, keratinization of some of the epithelial cells is evident.

Past History.—Mumps and chickenpox. Patient could not recall any other diseases of childhood; had been well always with exception of operation in 1929 for removal of a papilloma on palm of hand. There had been no recurrence of this lesion.

Habits.—Patient did not use tobacco or alcohol.

Occupation.—Manual training instructor.

Present Illness.—Patient consulted a dentist in 1930 for discomfort in right maxillary first premolar. This area was x-rayed and patient was told that first premolar was devital and infected with a discharging sinus to the surface. The first right maxillary premolar was extracted. Patient said that a white spot remained in this region thereafter.

The growth for which the patient now sought treatment first appeared a few months before and had been growing rapidly since. There had been no pain or tenderness at any time and no bleeding of the tumor. Physical examination was negative except for local condition.

Local physical examination was negative except for a hard, grayish, cauliflower-like growth on the palatal mucous membrane in the region of the mesiopalatal-cervical area of the right second maxillary premolar. The first premolar had been extracted seven years ago.

The lesion was raised, hornlike and composed of numerous, hard, pearl-like elevations. There was no induration about the base.

All the teeth were vital, and the remainder of the oral mucous membrane was normal.

Roentgenographic examination showed the bone to be normal beneath the lesion. There was no evidence of alveolar absorption or periodontal involvement.

Operation.—On May 14, 1937, under 2 per cent novocain-epinephrine local anesthesia the tumor was excised with the high frequency cutting current, including a margin of healthy tissue. The resulting wound was permitted to heal by granulation. It was not necessary to disturb the adjacent tooth.

Pathological examination revealed hyperplastic epithelial proliferation, with leucocytic infiltration. The hard, pearl-like excrescences consisted of keratinized epithelium.

Diagnosis.—Papilloma.

Convalescence was uneventful. Postoperative examination one year from date of operation (May 11, 1938) showed healthy tissue with no evidence of recurrence.

358 COMMONWEALTH AVENUE

CASE REPORTS

JEROME S. GROSBY, D.D.S., ST. LOUIS, MO.

CASE 1.—Mrs. S., age 26 years, complained of persistent hemorrhage whenever she brushed her teeth, and she sometimes found blood clots in her mouth when she awoke in the morning. She had been treated for pyorrhea, and her teeth were scaled at each treatment (reported by patient).

History.—Patient had had orthodontic treatment (completed) one year ago. Two years ago she had had a severe case of trench mouth, which was treated by intravenous neoarsphenamine. Case was so severe that hospitalization was necessary.

General health was good, and her occlusion was normal.

X-ray Examination.—There were deep pockets around the mandibular right bicuspid, the first and second molars and maxillary right first molar. These pockets were limited to the proximal surfaces.

Percussion was negative.

Transillumination revealed slight evidence of possible passive congestion around the pocket areas.

Palpation was negative except that pressure over the pocket areas produced ready hemorrhage.

Inspection.—Pockets present were deep and narrow. There was no pus, and no calculus. Tissues in this area bled readily. There was no caries, two small silver alloy fillings were in the mandibular first molars (occlusal).

Bacteriological Examination.—Smears from the pocket areas showed a predominance of fusiform bacilli and *Spirocheta Vincenti*. There were few pus cells and a small number of cocci.

Diagnosis.—Chronic Vincent's infection.

Treatment.—Patient was treated one and one-half months. Hemorrhage stopped completely after the fourth treatment. At termination of treatment, pockets were still present but smears were negative and all symptoms had ceased. Three months later smears were still negative and pockets were almost entirely closed.

Remarks.—This case shows the need for complete and thorough examination and history. The original diagnosis of pyorrhea that had been made and the resultant treatment only aggravated the condition. Repeated scaling had served only to traumatize the tissue and open new avenues for infection. The history in this case has a vital bearing upon the diagnosis. Earlier orthodontic treatment may have affected tissue resistance. The prior existence of this infection should have been cause for suspicion.

CASE 2.—Mrs. B., age 46 years, was told by her dentist that she had trench mouth and was being treated for it without improvement.

History.—Patient was at menopause. She had had soreness of mouth of three weeks' duration with no improvement under treatment. Recently (about two months before) she had started using a commercial tooth paste of high soap content.

General health was good, and her occlusion was good.

X-ray Examination.—Findings were negative.

Percussion was negative.

Transillumination was negative.

Palpation.—Gingiva was painful to touch and slightly edematous.

Inspection.—There was generalized inflammation of all gingival and associated areas. There were no pockets and very little calculus, no ulcers.

Bacteriological Examination was negative (normal).

Diagnosis.—Acute inflammatory (catarrhal) stomatitis.

Treatment.—Patient was advised to change the dentifrice. In one week the tissues were again normal. No recurrence.

Remarks.—Here is an example of a case in which a diagnosis had been made upon insufficient evidence, resulting in faulty treatment. Here too we find the value of a complete case history. Note that, in spite of advertising claims, not all dentifrices are harmless.

CASE 3.—Mr. P., age 26 years, had been treated for trench mouth, with but little improvement. Examination revealed ulceration on mandibular right buccal area; all teeth sore on percussion, and there was a marked salivation. Mandibular right second bicuspid and first molar were loose. Mastication was painful. Smear showed positive for Vincent's infection.

History.—Patient had had a 2-plus Wassermann and was under neoarsphenamine and mercury treatment.

Diagnosis.—Mercurial stomatitis complicated by Vincent's infection. The mercury treatment was discontinued, and treatment for Vincent's infection was instituted. One month later the mouth was normal.

Remarks.—The primary etiologic factor was a drug poisoning. Note the presence of Vincent's infection accompanying mercury and neoarsphenamine, two spirocheticidal drugs. This also illustrates a therapeutic observation: the organisms of trench mouth can build up a resistance to a drug used over a long period of time.

REPORT OF CASE OF MYELOMA OF MANDIBLE

GEORGE F. SEEMAN, D.D.S., F.I.C.D., NASHVILLE, TENN.

MALE aged sixty years.

Examination.—Large mass was seen on the lower right side of the mandible, extending under the tongue and protruding out into the buccal tissues (Fig. 1).



Fig. 1.



Fig. 2.

History.—Patient complained of neuralgic pains, and painful swellings appeared on the ribs and the skull. A spontaneous fracture of the clavicle occurred while the patient was attempting to shave himself.

Fig. 3.

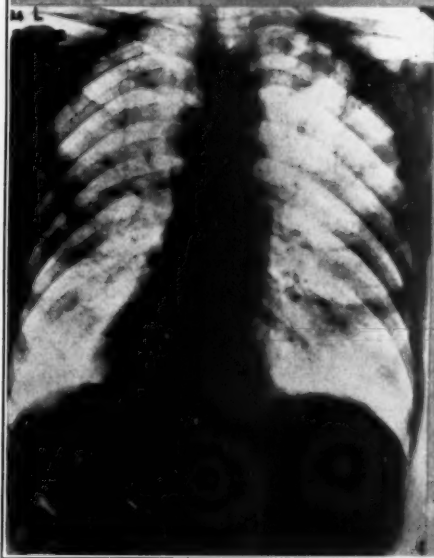
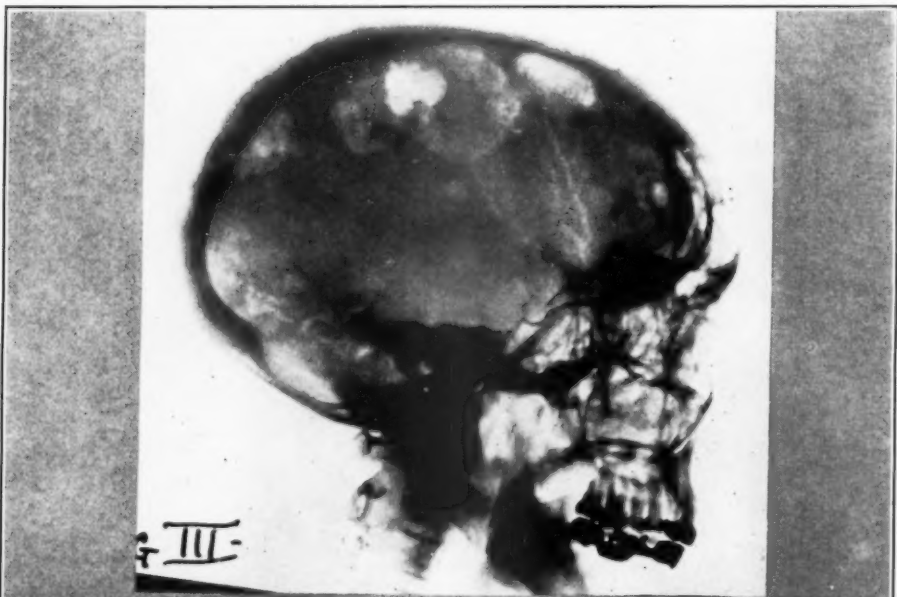


Fig. 4.



Fig. 5.

X-ray Findings.—Lateral view of the mandible showed bone destruction from the symphysis to the angle of jaw (Fig. 2). Subsequent x-ray pictures showed osteolytic defects in the skull, the ribs, and the pelvic bone (Figs. 3, 4, and 5).

Diagnosis.—Multiple myeloma. A primary malignant tumor of the bone marrow, marked by circumscribed or diffuse tumorlike hyperplasia of the bone marrow, and usually associated with anemia and with Bence-Jones protein in the urine. This was a giant-cell tumor or myelogenous sarcoma. General physical examination was unsatisfactory. Test for Bence-Jones bodies was negative.

Prognosis.—Patient died four months after examination.

FOLLICULAR CYST OF MANDIBLE

M. HILLEL FELDMAN, D.D.S.; F.I.C.A., NEW YORK, N. Y.

THE roentgenogram shown in Fig. 1 was made of a youngster of fourteen years.

Clinically, the cheek was swollen along the right mandibular area, and intraorally the outer plate was considerably distended. The patient was in no pain or discomfort at any time. Curiously enough, the left maxillary region



Fig. 1.

was also distended, and roentgenograms there disclosed a large follicular cyst with a sinus involvement.

In operating the mandibular cyst, after exposing the cyst wall, a rongeur forceps was applied to the cyst wall for traction. Complete enucleation followed, with the third molar tooth follicle attached to the membrane. This follicle may be seen in the roentgenogram quite high up, near the sigmoid notch. Cyst contents were straw-colored liquid with cholestrin crystals.

Uneventful healing followed light dressings for two months.

730 FIFTH AVENUE

Case Reports

After a number of fissural cysts were reported in the last issue of the JOURNAL, we are glad to present a very unusual cyst which seems to fall in the same category.

Discussion of this case as well as of preceding ones is invited. Please mail contributions to Dr. Kurt H. Thoma, 47 Bay State Road, Boston, Mass.

CASE REPORT NO. 14

MULTIPLE FISSURAL CYSTS

WILLIAM H. HYDE, D.D.S., BROOKLYN, N. Y.

Male, aged 44 years, married, born in Russia, cloakmaker, white, presented himself at my office on January 28, 1938.

Complaint.—Swelling of the jaw on the right side for the past six months.

History.—The patient had intermittent pains in his head and right side of face. Vision was badly impaired, especially of the right eye with occasional fogging. He was given glasses by an optometrist; these helped him slightly. He had difficulty in breathing, with a feeling of obstruction, especially on the right side, and acute pain in the upper vestibule. He visited his physician, who diagnosed the condition as chronic maxillary sinusitis and treated him with irrigation and ephedrine spray. A second physician suggested that the trouble might come from the teeth and referred the patient to a dentist.

The dentist made an examination and told the patient that the maxillary incisal area was infected and the two central incisors would have to be removed. He then visited another dentist, a cousin, who referred the patient to me.

Examination.—The whole right side of the face was painful, swollen, and edematous, with a peculiar puffy-like condition on the anterior aspect of the maxilla and the lower eyelid. There was no adenopathy. The mucous membrane appeared bluish in color in the region of the maxillary premolars. The bone was distended from intraosseous pressure. There was another swelling near the maxillary central incisors, and here again the bone was similarly distended.

The teeth tested with a Burton pulp tester responded, but the response was somewhat atypical, giving a range of 9-10 (normal 5-6). The lips, tongue, and cheeks appeared normal.

X-ray Examination.—The oclusal film revealed a large radiolucent, lobulated mass, cystic in character with fine trabeculae traversing it. The mass extended from the right maxillary third molar to the left central incisor (Fig 1).

Treatment.—Operation was performed, consisting of removal of the maxillary left central incisor and all the teeth on the maxillary right side, and ex-

cision of the entire cystic mass which was found to extend as shown in the x-ray picture. The membrane was very thin and adherent to the bony cavities, which appeared lobulated. The bone itself appeared very thin. The antrum was not penetrated, but the floor was displaced upward. The incisive foramen was involved by a small cystic mass continuous with the main mass, and the membrane here was thicker and less adherent to the bone. The incision was closed with interrupted suture.

Subsequent Treatment and Result.—General treatment and diathermy were given bi-daily. Headaches and pain disappeared. Vision became normal. The patient's general condition was very good on dismissal.

Pathology.—From the gross appearance I am of the impression that this could not be a radicular cyst nor a multilocular cyst. First, the membrane was very thin and very adherent to the bony wall, which is very uncommon in radicular cyst. . . Second, there was absence of cholesterol crystals in the fluid, which was dark brown in color and very thick in consistency. Furthermore,



Fig. 1.

the incisive canal cyst was not separated from the mass by a bony wall, but was continuous with it. The wall of the whole cyst was indented but did not consist of individual cysts, whose walls might be adherent to each other, as in a multilocular cyst.

Dr. Wiener's report: *Gross:* The specimen consisted of two nodular portions of firm, dark blue tissue, $4 \times 0.6 \times 0.4$ cm., and $1.3 \times 0.6 \times 0.5$ cm., said to have been removed from the jaw. The surface was rough and wrinkled.

Microscopic: The preparation consisted of a broad band of hyalinizing fibrous connective tissue partly covered on one side by stratified squamous epithelium or by cuboidal cells. In places there was a slight scattering of small round cells and large mononuclear cells. Another fragment consisted of a band of hyalinizing fibrous tissue covered by stratified squamous epithelium.

Diagnosis.—Wall of cyst of the jaw (benign).

Discussion.—From the clinical aspect and radiologic appearance one would believe that this was more likely an adamantinoma than either a radicular or a multilocular cyst.

DISCUSSION

Dr. Thoma.—After reviewing the microscopic preparation of the excised tissue I believe that incisor canal cyst can be definitely excluded. The lesion might be classified as a follicular cyst formed from a supernumerary tooth bud, but the x-ray picture is not quite typical. Another type of cyst has not been considered by the writer although the x-ray picture seems to give definite evidence of it; this is the fissural cyst of which some cases were published

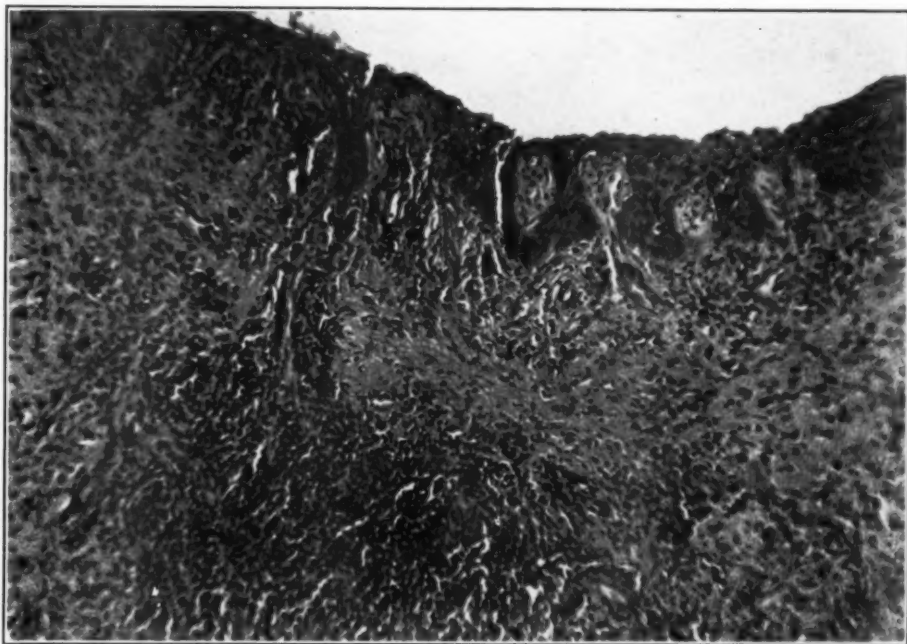


Fig. 2.

last month. I believe that this patient had two fissural cysts which, when they became large, fused, the connecting wall being destroyed by infection, the presence of which is indicated by marked round cell infiltration. One of the fissural cysts is a median cyst which caused the central incisors to diverge, a condition not seen in incisor canal cysts. The other is a globulomaxillary cyst causing a diverging of the lateral incisor and canine tooth. The microscopic findings are consistent with that of fissural cyst and there is evidence of considerable inflammatory infiltration and necrosis. I am adding a photomicrograph of the section (Fig. 2).

Department of Orthodontic Abstracts and Reviews

Edited by

DR. EGON NEUSTADT, NEW YORK CITY

All communications concerning further information about abstracted material and the acceptance of articles or books for consideration in this department should be addressed to Dr. Egon Neustadt, 133 East Fifty-Eighth Street, New York City.

Dentistry in the Eighteenth Century. Hedvig Lidforss Stroemgren, Copenhagen, 1936, Levin & Munksgaard.

There was once a time when, on the front of a little Boston shop, one could read:

Isaac Greenwood
mathematical instrument maker
umbrella manufacturer
and dentist

This happened in the eighteenth century, through which the Danish historian, Hedvig Lidforss Stroemgren, traces (in German) the development of dentistry. That century can be called the "ver sacrum" of dentistry, and all that was sown during that period sprang up in the nineteenth century; even today traces of those first pioneers in dentistry are still present. Today's generation enjoys the fruit of the work of those men, about whom this historian has given us an interesting survey. More appropriately, the title of the book should be "European Dentistry in the Eighteenth Century," because nothing is said about the American pioneers of those times like the above mentioned Mr. Greenwood and his sons, about Mr. Woofendale, Joseph le Maire, and James Gardette; although their work not only influenced the history of American dentistry but also contributed to the development of European dentistry. I do not know the author's reason for this omission, and I therefore must confine myself to her presentation of European dental history.

All twelve chapters begin with a historical review describing the status of affairs at the beginning of the eighteenth century, so that the new developments taking place during the century may be more easily understood by the reader.

In this manner the author reviews in Chapter I, which deals with anatomy and physiology, the contributions of Harvey, Malpighi, Borelli, and Highmore in order to evaluate properly the work of the Englishmen, Thomas Berdmore and John Hunter; of the German, Philipp Pfaff; and of the Frenchman, Pierre Fauchard.

Chapter II covers the operative phases of dentistry, with further reference to the above mentioned practitioners. Methods used at that time were: the filing away of carious parts of the teeth (forerunner of the "arthurizing" method of the nineteenth century); and the filling of unprepared teeth with tin, lead, and goldfoil. Pierre Fauchard, the most prominent practitioner of that time, considered gold the worst material for fillings. What may famous

Marshall Webb ("this hand was made to handle naught but gold") have thought of this theory a century later?

The two chapters dealing with artificial teeth before and after the invention of porcelain are perhaps the best in the book. Fauchard and Mouton dominate the carvings of bone in prosthetics, Duchateau and de Chemant the porcelain technique. Of particular interest in Chapter IV is the historical review of the invention and introduction of porcelain in dental practice, the alchemical search of Walter Tschirnhausen and Johann Fr. Böttger, which led to the invention of the real, hard porcelain, to be introduced shortly afterward into dental prosthetics by the aforesaid French apothecary.

The most voluminous chapter is the fifth, dealing with surgery. It offers a splendid presentation of the development of the surgical profession in France, the classical country for surgery in those days. A comprehensive review is given of surgical instruments and of various methods of tooth transplantations and retransplantations. At the end of the chapter, jaw and antrum operations are illustrated. Thus for practitioners of oral surgery, the Stroemgren descriptions illustrate many interesting items.

The part of the book most interesting to our readers is, no doubt, Chapter IX, which deals with tooth malpositions. The famous English scientist, surgeon and dentist, John Hunter, receives due appreciation. In fact he is considered the forerunner of modern orthodontics, in theory and practice. No doubt he was far ahead of his time with his doctrines about the etiology of malocclusions; as regards treatment, he was first to think about the stretching of the jaws and to propagate the inclined plane and the redressement forcé. Then Pierre Fauchard again occupies the field with his perforated gold and silver plates, silk ligatures and various other appliances. His encyclopedic work: "*Le Chirurgien Dentiste*" serves throughout this century as a pillar of dental science.

Chapter XI deserves special attention and deals with the dental profession itself. The history of a profession and its science are so closely linked to each other that the knowledge of both is indispensable for the right conception of either. The data given by the author are pertinent and interesting, especially her conception of the division of the profession: on one side the registered practitioners of dentistry (for instance, the Italian Antonio Campani); on the other side, the charlatans, barkers and the quacks (for instance, Antonio Campioni). This was an unwholesome state, which had its roots in former days and has carried its undesirable fruits even into our time.

Unfortunately the description of and the elaboration on the importance of the May edict of 1699 of Louis XIV are missing, that Magna Charta of all our present professional developments. This edict is one half year short of the eighteenth century, but historical periods are never quite distinctly limited. By this edict a new privileged guild was created in France: "*Chirurgien Dentiste*" (up to the present day the official title of French dentists), subject to special training and examinations. It was the beginning of a new era, a strong impulse, which was largely responsible for the present dental profession and science. By this edict France secured her professional hegemony for the eighteenth century. This hegemony has not been sufficiently elaborated by the

author and consequently not its further evolution: that in the last quarter of the eighteenth century the French dentists, Joseph le Maire and James Gardette (also the Englishman, Woofendale), transplanted this hegemony into American soil, where it thrived throughout the nineteenth century and was preserved up to the present day.

Notwithstanding these deficiencies, Stroemgren's book is worth reading. It is most instructive, and the author deserves a great deal of credit because of her minute study of an enormous quantity of historical literature.

Especially in the United States this book should have a wide circle of readers, as the source for the successful development of American dentistry springs from the eighteenth century and is here described with historical truthfulness. Whoever wishes to understand properly the development of American dentistry must know the history of European dentistry in the eighteenth century.

Henrik Salamon, Budapest.

Editorials

The First Annual Meeting of the American Association of Orthodontists, Los Angeles, July 11-14, 1938

THE newly formed American Association of Orthodontists, comprising the majority of the sectional orthodontic societies of the United States under one great head, similar to the organization of the American Dental Association, has rung down the curtain on its first annual meeting. It required several years of painstaking work on the part of the officers and various committees to evolve the present organization from the former American Society of Orthodontists.

The former American Society of Orthodontists at no time during its vigorous existence held its annual meeting on the Pacific Coast; however, paradoxically, the *first* annual meeting of the newly formed Association was held in one of the West Coast's best known cities, Los Angeles (Hollywood), California. On account of the stage setting, the meeting, as anticipated, was definitely "different." In this glamorous city, where graying hair and the springless step are rare enough to attract attention, the members entered into a fraternal spirit and fellowship that formed many new friendships and re-cemented old ones of years' standing. According to President James D. McCoy, in one of his forensic sallies, at the close of the first day's session, those who were suffering from general dehydration might find quick relief within the spacious hotel patio where the cool zephyrs of the Pacific, the singing of the mockingbirds, the tinkling of ice within glasses, and the music of a Mexican stringed orchestra would offer ready relief. His prophecy was correct.

The meeting got off to an interesting start on Monday, when the golfers, under the genial and hospitable guidance of the golf committee—Drs. Higson, Nance, McIntosh and Casto—played over the beautiful Bel-Air golf course, one of the most unusual courses in the world.

After a short stop at the gorgeous Los Angeles Country Club on the return trip to the hotel, many of the golfers and a large portion of the membership attended the stag golf dinner in the evening. The genial Frank Casto, erstwhile of Cleveland, now of La Jolla, California, as master of ceremonies directed the entertainment and the awarding of the prizes. Accordingly, the dinner concluded as a festive occasion, and was the end to a perfect day.

The formal meeting opened on Tuesday, with President McCoy in the chair. An interesting address of welcome was delivered by Dr. R. B. von KleinSmid, president of the University of Southern California, and was ably responded to by Dr. William R. Murray of Evanston, president-elect of the American Association of Orthodontists. The entire day on Tuesday was devoted to the formal and scientific features of the meeting. The feature of the evening was the banquet and entertainment, "A Night in Hollywood." The entertain-

ment features included some of the star theatrical talent of the movie capital, and this was followed by dancing to the strains of a Hollywood string band, until far into the moonlit night.

Another innovation was the special clinics on Wednesday evening, which were organized in four sections, and each clinic was given four times to rotating audiences. Group 1, "Conveying Orthodontic Information to the Dentist and the Layman," by Paul G. Spencer of Waco, Texas, and N. W. Goodman of Los Angeles; Group 2, "The Welding of Chrome Alloy," by J. Lyndon Carmen, Kermin E. Taylor, G. H. Siersma, all of Denver, Mark Perrin of Topeka, Kansas, George Herbert of St. Louis, and Books Bell of Dallas; Group 3, "The Fabrication of the Removable Lingual Arch Wire and Its Auxiliaries," by Oren A. Oliver of Nashville, Claude R. Wood of Knoxville, Russell E. Irish of Pittsburgh, and E. B. Arnold of Houston; Group 4, "Aids in Orthodontic Diagnosis," by Harvey A. Stryker and Fred Wolfshohn of San Francisco, Will G. Sheffer of San Jose, California, W. Wash of Stockton, California, and Earl F. Lussier of San Francisco.

Another feature of the meeting was "The Exhibit of Treated Cases." In this a number of outstanding orthodontists who advocate and use certain types of appliances exclusively submitted groups of cases demonstrating the results of treatment. Charles Tweed of Tucson exhibited 100 cases he treated with the Angle edgewise technique. Oren A. Oliver, Claude R. Wood, Russell E. Irish and E. B. Arnold exhibited 100 cases in which the removable lingual arch wire and its auxiliaries had been employed. Glenn Young, George Grieve and Gerald Franklin exhibited a fine display of 100 cases in which the half round pin and tube appliance had been utilized. Another group of 100 treated cases was presented by James D. McCoy and John R. McCoy, showing results gained where the open tube appliance upon the maxillary teeth and the removable lingual arch wire upon the mandibular teeth were the orthodontic mechanisms used in treatment. Orthodontists perusing these fine exhibits of results quickly reached the conclusion that the day of intolerance toward any proved mechanical technique in orthodontic practice is over, that it is "the man behind the gun" and his devotion to his task that secure these fine results. It could easily also be assumed that operators responsible for such results could probably have secured a very satisfactory result in these cases with an old brass expansion arch, eight or ten yards of grass rope and a handful of spool wire, had they been forced to use them on a desert island. In viewing this exhibit many were heard to voice the expression, "It's not what you use, it's what you can do." "How you do it depends on how you alone can do it best."

Thursday, the last night of the meeting, Dr. Leuman Waugh of New York City gave an interesting lecture before a special meeting of the First District Dental Society of Los Angeles. This was a joint meeting in honor of the visiting orthodontists. Dr. Waugh's subject was "Deductions From a Survey of the Food and Dentition of the American Eskimo," and he presented his findings pertaining to the problems of dental caries, periodontoclasia, and jaw and face growth, showing the result of his several expeditions to the North. The lecture

was beautifully illustrated by means of colored pictures and proved to be highly interesting and informative to the members of both organizations.

The ladies' entertainment feature, ably handled under the direction of John R. McCoy, Walter Furie and Albert Voss, consisted of radio broadcasts, style show, president's reception, visit to Max Factor's make-up studios, and a theater party at the famous Grauman's Chinese Theater.

Still another innovation, arranged by Walter Furie and John Taylor for visiting orthodontists at the close of the meeting, was the deep sea fishing expedition to Catalina Island. This trip was a great success and enabled some of the visitors to add a thrill by catching the wicked barracuda, the much prized tarpon, and the lowly mackerel.

The annual Albert H. Ketcham memorial award given by the American Board of Orthodontists was conferred on Alfred H. Rogers of Boston for his outstanding contributions to orthodontic literature and practice. This award is made each year in token of appreciation for constructive additions to orthodontic knowledge. Dr. Rogers' work in the field of myofunctional therapy in orthodontics is traditional and well known to all orthodontists throughout the world, and he richly deserves this recognition.

What will probably go down in history as orthodontists' most colorful and interesting meeting has been concluded. It was ably handled with fine cooperation on the part of all committees and officers; and when the members returned home with the report that they had been in Hollywood, that alone inspired an attentive ear and a receptive audience.

The officers who will lead the organization for the ensuing year are President, Harry Allshouse, Kansas City, Missouri, who was selected to succeed the late Frank A. Delabarre of Boston, who died just a few weeks before the meeting; President-Elect, William Murray of Evanston; Vice-President, Harry L. Hosmer of Detroit; Secretary-Treasurer, Claude R. Wood of Knoxville.

Orthodontists who attended this meeting, enjoyed the hospitality, and absorbed the perfect brand of California weather ordered especially for the meeting, will say to all the officers and committees responsible for this meeting, "Thanks for the memories."

H. C. P.

Dr. C. V. Mosby Honored

THE honorary degree of Doctor of Science was conferred upon Dr. C. V. Mosby by Bates College, Lewiston, Maine, during the June, 1938, graduating exercises. This degree was conferred in recognition of his valuable contributions to medical and dental education as a publisher of scientific medical and dental works.

Dr. Mosby's career is the story of a Missouri farm boy, who, after working his way through medical school, became the head of one of the leading publishing firms of medical and dental literature in America. His intimates are numbered among the medically and dentally great of America. He has been

responsible for the launching of nine scientific journals devoted to the advancement of the various specialties of medicine and dentistry, all with wide circulations throughout the world.

Of further particular interest to orthodontists is the fact that Dr. Mosby conceived and started the AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY about twenty-two years ago (then the International Journal of Orthodontia and Oral Surgery) because he believed that the infant science of orthodontics was destined to assume a conspicuous place in health services. It is gratifying to know that his confidence in the future of orthodontics has been justified.

His numerous friends among the professional men of the world will be pleased to learn of this signal honor, and to share with him the happiness its receipt no doubt has brought.

H. C. P.

News and Notes

After the Hollywood Meeting of the American Association of Orthodontists

Westward, ever westward, the tide of orthodontists flowed. That is really poetic license because one man came north from Lima, Peru; a whole delegation came south from Oregon and Washington; and at least one came from Mexico, D. F. Nevertheless the tide flowed; a few on ships, some on streamlined trains; others caught the Challenger; many came by automobile; but one fellow admitted that if he had not had a good thumb he would have missed the best meeting he has ever attended.

To many, the trip west was an opportunity to fulfill a lifelong ambition; a chance to see more of the country. To many the trek was just force of habit, for there are a great many orthodontists who never miss a meeting. But to the large majority it meant new and better ideas, an opportunity to improve their technique, and a means of obtaining better results in their practice; but to all it meant the renewal of old friendships and the making of new ones, which is the pleasantest part of an orthodontic convention.

As usual the body which controls the destiny of the American Association of Orthodontists was on hand Friday, and very busy. Frank Casto, since he moved to La Jolla, has metamorphosed into a typical Chamber of Commerce agent, and he did a fine job of mixing play with work for the members of his Board. He served as a sort of a one man reception committee until the job got too big for him on Sunday; then he "holed up" and turned the job over to the local arrangements committee. Dr. De Vries of Minneapolis sneaked away from Casto, and work, long enough to find some one with whom he could talk big game and ballistics.

By Monday the Hollywood Roosevelt Hotel was alive with orthodontists. There were more women in proportion to the registered orthodontists than at any previous session of the organization; and from the way this contingent fell for the parties and tours which had been arranged by Dr. John McCoy and his committee, it is plainly going to be a problem in the future for the men to get away to another convention by themselves.

The very fact that glamorous Hollywood lay at their feet seemed to fill each visitor with a spirit of expectancy, and an occasional movie star, either past or present, caused a flutter and a quickened pulse when he or she walked across the hotel lobby. The renewal of friendship kept the lobby in a constant turmoil; some greetings were boisterous, and others dignified.

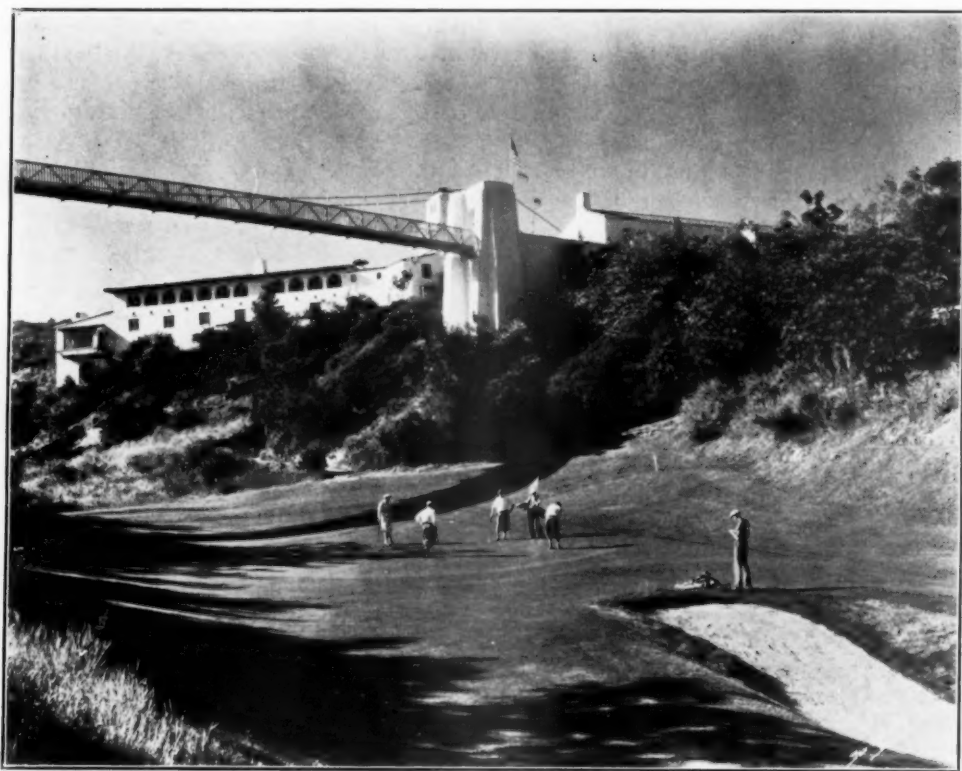
As is the general custom at all four day meetings of the organization, the golfing fraternity was astir at an early hour on Monday. The same old standbys of former meetings were up and ready to board the buses for the famed Bel-Air course in anticipation of a day of pleasure, but they had no idea of what was in store for them; they ah-ed and oh-ed and gee-ed as they followed the bridle path through the heart of Beverly Hills and tried to recognize the many equestrians on their superb mounts. On each side of the beautiful thoroughfare and on up the hills were homes, palaces, and estates which rival any idea of fairyland.

Driving on out Sunset Boulevard, over the rolling hills and at the foot of a low range of mountains, dotted with gorgeous residences, the bus turned through a gate, and suddenly the beautiful Bel-Air Country Club commanded the attention of every one. To the right and left of the road the golfers noted the perfect short grass fairways and the marvelous undulating cocos-bent greens, a sight to quicken the pulse of any golfer.

There, to greet the first contingent of players, were Al Higson and his committee, to look after the golfers and check their handicaps, a very important matter in any tournament, let alone a bunch of orthodontists far from their home ranges and rarin' to go.

It is still a mooted question how Al Higson secured the exclusive use of the course for a whole day, to the exclusion of the high and mighty of the film and business world, who are not in the habit of being told that they cannot play on their own course.

When the bus deposited its load of orthodontic golfers on the lawn in the rear of the clubhouse, a feeling of excitement seemed to envelop the crowd. The beauty and perfection of the setting blended with the superb panorama of magnificent homes and gardens on the hillsides in all directions. Every caddie at Bel-Air knows his chamber-of-commerce talk by heart, and not one lost an opportunity to tell about this or that house and the movie star, the merchant prince, or the banker who calls it home. The one movie star that all caddies rave about and who lives on the bluff is Charlie McCarthy. If you believe everything they tell you, you may expect to find your ball missing at the fourth green and eventually locate it in the cup; and, if you look hard enough, you may see the termite-infected Charlie laughing at you from behind some tree or shrub.



The Eighteenth Green of the Bel-Air Country Club

But the golf club itself, is really something to talk about. Although the course is 6,281 feet in length, it occupies only 109 acres, which is an item when it is realized that it is situated in the heart of one of the most expensive residential districts in the world. Although the course is located in a rather hilly section, the use of a 300-foot extension bridge and of 4 tunnels takes the hill out of the hill climbing and makes it unique. The 9th and 18th greens are located in canyons that approach both side of the clubhouse and are 80 feet below it. A 250-foot tunnel under the clubhouse joins these two greens, and an elevator connects this tunnel with the clubhouse, so players from either green can walk to the center of the tunnel and take the elevator up to the 19th hole. The climb from the 5th to the 6th green evidently was too much of an effort for a wealthy oil man from Long Beach; he spent \$35,000 on a 370-foot tunnel. After one has played 9 holes and has reached the clubhouse via the tunnel and elevator, he is confronted with a most unusual tee shot on the 10th hole, a 140 yard carry across a ravine, some 75 feet deep, and

is out of bounds if he fails to get across. A beautifully designed 300-foot extension bridge spans the ravine, saving a walk down into the ravine and up on the other side.

With such a layout to play on, is it any wonder that the course was filled with visiting orthodontists? With perfect golfing weather and a perfect course, the hooking and slicing commenced, and from then on there was never a dull moment. I suspect it was Charlie McCarthy who substituted one of those trick, cock-eyed balls on Bill Flesher. He was only two feet from the pin on No. 6 when he started to putt, but ended by taking 6 putts before his opponents would allow him to change his ball.

When the smoke of battle cleared, about 40 golfers adjourned to the most beautiful hole of all—the 19th—and the postmortems began. The bus driver and the golf committee rounded up the group and safely stored them away in the buses, and the members returned to the Roosevelt Hotel for the stag golf banquet. This affair was presided over by Frank Casto and, as is customary, the great and the near great of orthodontics were present.

Gaiety, good humor, good food, and fellowship reigned supreme. With appropriate ceremony, Paul Spencer inducted Jim McCoy into the exalted office of High Mogul of the Ancient and Honorable Society of Bell Ringers. Oscar Busby did himself proud with the best speech of the evening. Dr. R. B. P. Campbell, an associate of Bob Le Cron of London, was introduced, as well as such luminaries as Harry Allshouse, Claude Wood, Nye Goodman, and Charlie Benbrook.

After Hays Nance relinquished his right to the president's trophy for low gross (Hays was on the golf committee), the winners were allowed to take their pick of prizes. Dr. A. S. Bumgardner of Charlotte, N. C., was next in line and graciously accepted the much be-zippered cross between a trunk and a golf bag as his memento of prowess. Other prizes were won by Frank Heimlich, W. F. Clark, C. C. Benton, W. T. Chapman, Hays Nance, Harry Bleeker, M. J. Buckley, Bill Flesher, Leo Shanley, H. V. Barker, and W. W. Leslie.

The first regular session of the meeting opened on Tuesday. It gave many members an opportunity to see our president, genial Jim McCoy, in action for the first time. When Jim begins to talk about the meadowlarks and the butterflies, you had better begin to hold on to something, because he is off on one of his flights of oratory, the like of which is seldom heard; only his nearest friends, and he has legions, know how he can really soar.

Dr. McCoy's introduction of his pal, Prexy Von KleinSmid of the University of Southern California, was a masterpiece, and the learned Doctor himself is not amateurish with typical Southern California phrases. Dr. Von KleinSmid literally took down his hair and made himself right at home with his audience. He told us what our duty was and insisted upon our going back home and doing it; and he did it in the nicest and most genteel manner.

Evidently the program committee wanted the younger members of the organization to meet the two most beloved members of our group early, because they were given the places of honor which followed directly after the opening ceremonies and the President's Address. Dr. Alfred Paul Rogers, that kindly, dignified gentleman from old Boston, recounted by paper and motion picture the results of his studies on myofunctional therapy. Following Dr. Rogers came that perfect exemplification of all that most of us secretly cherish as our ideal—gentleman, student, real sportsman, and highly efficient orthodontist—Dr. Harry Kelsey of Baltimore, who discussed the position that the frenum labium holds in orthodontic practice.

Then Oren Oliver led off the afternoon session in his masterly way, and a marvelous paper by Herman Becks and several reports on business of the convention followed.

Before the session ended there was a nervous tension spreading over the group. Men looked at their programs and began whispered conversations with their neighbors. All over the spacious Blossom Room could be heard such hushed questions as:

“What about this President's Reception?”

“Are you going to Jim's reception?”

“What is this reception business?”

“Where is the Patio?”

“Is it like a tea?”

“Do we need a drink before we go?”

"Will there be a lot of women there?"

"I wonder if I ought to go?"

A surprise was in store for the doubting Thomases when they stepped out of the elevator at the third floor and were guided to the door which led to the patio (roof garden to Easterners), and heard the soft murmur of women's voices and the strumming of Spanish guitars. The gay colored chairs, the multicolored porch swings, and the perfect 72° Hollywood temperature made a fitting setting for the President's party. The long smart evening gowns of the ladies and the spotless white suits of the men made a picture worthy of any M. G. M. colossal production. As a background the hills of Hollywood, dotted with beautiful homes, trees, and gardens, seemed to complete the scene to the satisfaction of every one. A capable corps of waiters saw to it that all were plentifully supplied with an assortment of cocktails, and a troupe of Mexican musicians entertained the crowd with the appealing strains of *La Paloma*, *La Golondrina*, *Cielito Lindo* and other well known Latin-American songs. Just to keep the throng of 500 orthodontists, their wives and friends from thinking they had been suddenly transported to some far off isle, the noise and clamor of streetcars and motors on the famed Hollywood Boulevard immediately below were a constant reminder that Hollywood is just another city and that life goes on, regardless.

The President's Reception was timed perfectly to put every one in the proper mood for the "Night in Hollywood" which was to follow. Everybody met everybody else, and the formal, stiff feeling of the first few minutes of the party disappeared like the haze which hung over the Hollywood hills. Dinner groups were arranged, dances were asked for, and trips to the night clubs of the movie capital were planned. Everybody was happy when it was announced that all was in readiness for the banquet and floor show in the Blossom Room.

And what a floor show! Hollywood knows how; and when the little half-pint girl dancing partner slid across the floor and disappeared under the table, the evening's entertainment was completed. The entertainers folded up their paraphernalia and disappeared like Arabs in the night, and the orthodontists and their ladies moved out on the floor to prove that they had something on their minds besides crooked teeth and how to straighten them. Of course the youngsters like Brooks Bell of Dallas and Henry Barber, Jr., of New York gave a clever exhibition of the new steps, but it took the oldsters to give the crowd a thrill as they smoothly waltzed to the rhythmic strains of the Merry Widow waltz. With heads up and a merry glint in their eyes, the dancers waltzed, fox-trotted, dipped and shuffled, until the signal sent them off the floor and to their various rendezvous, whether it be to bed or to the movie haunts in search of further relaxation and excitement in Hollywood's gay night life.

Beginning with the Wednesday morning session the men went to work, and the ladies disappeared and returned only in time for meals, about the only thing which was not furnished them by the committee. Their days and nights were filled with excitement: a trip to Max Factor's to learn the art of make-up, a night at the C.B.S. new broadcasting station, a movie at the famous Grauman's Chinese Theatre, and a fashion show and tea at Bullock's Wilshire.

On Thursday evening Dr. Waugh presented his lecture on his work in the Arctic. After four days the effects of a strenuous meeting began to be felt. Papers and clinics, over which the readers or clinicians had labored and burned much midnight oil, had been delivered or shown. The responsibility of reading convention reports was over with no more worries until next year. New acquaintances had been carefully catalogued, and old friendships had been enjoyed for four days. It then became a question of when and how to get started back home. The trek began; some by train, some by ship, many by motor, a few by air, one by motorcycle; and from the way some had spent their money in Hollywood, I imagine the trusty thumb was the only thing they had left.

Adios for a year. See you in Kansas City in 1939.

EDMUND M. JOHNSTON,
Riverside, Calif.

American Dental Association

The eightieth annual session of the American Dental Association will be held in St. Louis, Mo., October 24-28.

American Dental Assistants Association

The fourteenth annual session of the American Dental Assistants Association will be held at St. Louis, October 24-28, with headquarters at the DeSoto Hotel. For further information, address

LUCILE S. HODGE, Secretary,
401 Medical Arts Bldg.,
Knoxville, Tenn.

American Dental Hygienists' Association

The American Dental Hygienists' Association will meet October 24-28 at St. Louis.

DAISY M. BELL, Secretary,
974 Amherst Street,
Buffalo, N. Y.

Association of American Women Dentists

There will be a meeting of the Association of American Women Dentists in St. Louis, October 24-28.

ELSIE GERLACH, President,
808 South Wood Street,
Chicago, Ill.
MABEL M. DIXON, Secretary,
City Building,
Hastings, Neb.

German Dental Convention

The seventy-fifth meeting of the German Society for the Treatment of the Mouth, Teeth and Jaws is to be held October 5-9 in Berlin, Reichstagsgebäude.

The theme of the meeting will be: "Prevention of Diseases Through Dental Science." The program will consist of the following lectures: (1) Schoenbeck: Dental Materials; (2) Schroeder: Insufficiency of the Human Dentition; (3) Wannenmacher: Principles of Filling Methods; (4) Muench: Root Canal Treatment; (5) Hammer: Oral Surgery; (6) Korkhaus: The Struggle Against Malocclusions; (7) Meyer: Teeth and Body Health; (8) Neuhaeuser: The Mouth in Its Relation to the Whole Organism; (9) Weski: Tartar as a Factor Detrimental to Health; (10) Schrickel: Psychology in the Treatment of Children; (11) Schroeder: Caries Prophylaxis.

Forsyth Dental Infirmary for Children

There will be a reunion of all graduate internes of the Forsyth Dental Infirmary for Children, Boston, at the meeting of the American Dental Association in St. Louis in October.

To make your reservation for the luncheon in honor of the founders of Forsyth, as well as its director Dr. Percy Howe and his staff, write to:

DR. ROBERT A. HARRIS, JR.
University Club Bldg.
St. Louis, Mo.

Argentine Orthodontic Association

The first meeting of the Argentine Orthodontic Association was held in Buenos Aires, Argentina, on July 4-8. The program was as follows: Addresses in honor of Dr. Antonio J. Guajardo by the president of the society, Dr. Monti; by the president of the meeting, Dr. Carrea; and by the secretary of the society, Dr. Bertini. "Experimental Investigations" by Dr. Rudolf Rehak; "Preventive Orthodontics" by Dr. Juan Ubaldo Carrea; "Histopathologic Studies in Experimental Orthodontics" by Dr. Telesforo Olaviaga; "Impression Technique in Plaster and Modeling Compound" by Dr. V. Y. Bertini; "Practical Demonstrations of Appliances" by Drs. Antier, Finocchetti, Samaritano, Guardo, Bertini, Samanego, Avendano, and Iturbide; "Easy Access for an Odontoma" by Drs. Monti and Careavallo; "Surgical Work on the Cuspid and Adaptation of Appliance" by Drs. Monti and Vovone; "Physiological Inheritance, Old and New, in Etiology of Anomalies" by Dr. Emuzj Real of the University of Bologna, Italy; "Surgical Correction of Protrusion" by Dr. V. Bertini; "Two Cases of Orthodontic Corrections" by Drs. Guardo and Locci; "Mixed Appliances of Gold and Platinum and Steel" by Dr. S. Bausett; "Spring Technique" by Dr. R. E. Otano Antier, "Open-Bite" by Drs. Locci and Guardo; "Palatal Vertical Springs on Fixed Appliances" by Dr. L. E. Tamini; "Case Report" by Dr. G. Korkhaus of Rhein, Germany; "Exhibition of Scientific Photographs" by Dr. Howard E. Strang of Chicago, Ill.; "Closed Bite" by Dr. Samantino; "Secondary Inclusion of Deciduous Teeth" by Dr. M. A. Finocchetti; "Practical Demonstrations of Appliances" by Drs. Antier, Finocchetti, Samantino, Guardo, Bertini, and Samengo; "Treatment of Class II" by Dr. Monti; "Space Maintainers" by Dr. L. Bengochea; "Construction of Cast Bands" by Dr. L. Tamini; "The Edward Griffin Arch" by Dr. Fernandez Diez.